465

New Orleans Medical

and

Surgical Journal

Vol. 89 MARCH, 1937 No. 9

THE DIAGNOSIS OF MALIGNANCIES OF THE LUNG FROM THE PATHOLOGIST'S STANDPOINT*

JOHN A. LANFORD, M. D.
NEW ORLEANS

Neoplasms of the lung are not a rare disease. In fact when we consider that the lung is a filter through which passes blood and lymph from all parts of the body, it is not surprising the statement can be made that the lung is possibly the most frequent site of malignant disease, that is, those which arise primarily in the lung and its component structures, and those that are secondary to neoplasms in other parts of the body.

Neoplasms of the lung may be classified into benign and malignant types. By the term benign type is meant one that is histologically benign, but unfortunately, because of the structure of the lung, a new growth arising in that body, while histologically being benign, has within itself the possibility of creating so much disturbance of the normal function of the lung, that it can be classified as malignant by virtue of position. The most common types of neoplasms of this character are the adenomas, fibromas and chondromas.

Among the primary malignant neoplasms of the lung, carcinoma is by far the most common. The secondary neoplasms will include carcinomas primary in other parts of the body, particularly in the liver, gastrointestinal tract, breast and uterus, sarcomas, melanomas and lymphomas. There are also a small group of neoplasms that arise in structures within the mediastinum, which rather quickly extend secondarily to the lung tissue or at least encroach upon the structures of the lung, especially the bronchi in the hilum, and interfere with the normal function of the organ, and bring about conditions that are very deleterious if not fatal to the life of the individual.

The most important neoplasm of the lung possibly, is a primary carcinoma, and judging from the great number of articles appearing in the current literature, and the reports from the various medical centers, one would be inclined to assume that primary carcinoma of the lung is on the increase. Certainly, in our Clinic we are seeing a great many more primary carcinomas of the lung than we have in previous years. It is of course possible to explain this increase on improved diagnostic methods, both clinically and radiologically, as well as from the standpoint of the laboratory worker. In a recent article, Arkins claims that primary carcinoma of the lung comprises from 6 to 8 per cent of all carcinomas. In frequency, it ranks next to malignant conditions of the gastrointestinal tract.

Twenty years ago not more than 5 per cent of the cases were diagnosed clinically as carcinoma, whereas today more than 50 per cent are recognized, and it is believed that with careful consideration of all the symptoms, the clinician should pick up at least 90 per cent of the primary carcinomas of the lung.

ETIOLOGY

If the increased number of carcinomas of the lung is real and not apparent, it is well to consider at this time some causes which may explain their increase. Since it is generally accepted that chronic irritation plays some part in the production of malignancy everywhere, it

*Read before the Louisiana State Medical Society, Lake Charles, April 27-29, 1936.

may therefore be assumed that any irritating substance that is inhaled through the air may play some part in bringing about malignancies of the lung. Among these irritating substances may be mentioned the dust of cobalt and arsenic containing ores, as well as radio-active substances. The highest incidence of carcinoma of the lungs is in miners who aspirate arsenic containing radio-active dust in the Sheeneberg mines in Jugoslavia. With the increased use of gasoline driven engines, such as automobiles and other motor vehicles, the air is more or less constantly filled with varying amounts of irritating gases from the exhaust of these motors, and it is thought that possibly the inspiration of these substances plays a part in chronically irritating the bronchial mucosa. It is also thought that possibly the irritation due to the dust of tar treated highways may play some part, but no statistics are available to prove the statement. However, statistics do show that 90 per cent of all the patients who suffer with malignancies of the lung (carcinomas of the lungs) were chronic tobacco smokers, and it is believed by some that the inhalation of tobacco may play an important part in producing sufficient irritation to bring about epithelial metaplasia of the bronchi or bronchioles.

AGE INCIDENCE

Recent statistics show that more than 89 per cent of cases occur between the ages of 41 and 70, only 9 per cent occurring between 21 to 40 years of age. Males are by far the more frequently afflicted individuals, and statistics show that from four to ten times more men than women. Arkin reported 125 men and 10 women in his series of 135. Negroes seem to be rather immune to this disease, only 9 per cent of Arkin's 135 patients were negroes, but it is highly possible that in the southern sections of the United States, the percentage would very probably be greater.

DISTRIBUTION

A knowledge of the distribution of these new growths in the two lungs is important from the clinical standpoint as an aid in diagnosis. Sixty per cent occurred in the right lung, and 40 per cent in the left lung. The greatest number occur in the upper right lobe; next, the upper left lobe, lower left lobe and then right lower lobe, the right middle lobe being practically free from involvement primarily.

All primary carcinomas of the lung arise either in the trachea, bronchi or the bronchioles, having their origin either from the covering epithelium or the mucous glands of the part. Formerly, it was claimed that they arose from the alveoli, but it is generally accepted now that the lining of the alveoli of the lung is not epithelial but endothelial in type. By far the most frequent type springs from the bronchial mucosa, as the result of metaplastic changes in this structure.

TYPES OF LUNG CARCINOMA

Depending on the degree of differentiation and the rate of growth, three distinct types of carcinomas can be recognized histologically. The alveolar or gland cell type called adenocarcinoma, the squamous cell type and the round or somewhat spindle shaped type. The round or spindle shaped type cell carcinoma is very uncommon and extremely malignant, because of its low degree of differentiation, and the ease with which it metastasizes. The adenocarcinoma type or gland cell type, which is characterized by the formation of large alveoli, is quite malignant and is rather prone to metastasize. The least malignant type is the so-called squamous cell variety. However, it has been my observation, that in every case a careful search through many areas of the tumor in the different parts of the lung will reveal very commonly both the adenocarcinoma arrangement, and the squamous cell type arrangement.

Anatomically, primary carcinomas of the lung can be divided into five types: (1) intrabronchial; (2) hilar or central; (3) intermediary; (4) peripheral and (5) lobar or diffuse. A knowledge of such division is of importance in the early diagnosis of the disease, and especially in the treatment that is possible or that offers any hopes whatever for recovery. If it is found that the lesion is intra-bronchial or confined to a single lobe or even a single lung, surgical procedure offers some hope of cure.

EXTENSION OF GROWTH

Primary carcinomas of the lung not only

have great invasive power, and infiltrate the surrounding lung parenchyma, but they have the property also of extension through the lymph current as well as through the blood current. For this reason the prognosis of these neoplasms is extremely unfavorable, and it is only in the very early diagnosed cases that surgery is of importance and offers any hope whatever for the recovery of the patient.

Metastases usually first occur through the lymph stream to the regional lymph nodes, cervical lymph nodes, axillary lymph nodes and abdominal lymph nodes and then by extension, to the pleura, finally gaining entrance into the circulation to produce secondary new growths in the liver, kidneys, lungs or nervous system.

DIAGNOSIS

Diagnoses of neoplasms of the lung and bronchi usually can be made by clinical or roentgenologic methods, but there are certain laboratory procedures which are resorted to which are of importance in confirming the diagnosis and determining whether or not the neoplasm is primary in the lung or elsewhere. These laboratory methods should be looked upon as confirmatory efforts and are to be made only in complete cooperation with the clinician, the roentgenologist and the surgeon.

The materials needed for the laboratory worker to confirm the diagnosis of malignancy of the lungs are one or more of the following:

1. Biopsy material removed by means of the bronchoscope from the neoplasm itself.
2. Material expectorated from the lungs.
3. Biopsy material from the regional lymph nodes, especially the axillary or cervical glands.
4. Pleural exudate.

Possibly the most important of these materials is bronchoscopic biopsy material. Such material may be obtained before the lesion has extended beyond its primary site, and if by radiological study, the location of the neoplasm is confined to one spot, the removal of the involved lobe or lung offers hope for complete recovery. However, if the axillary or cervical lymph nodes are involved, or material is expectorated by the patient from the lungs, or if pleural exudate shows neoplastic cells, the diagnosis is of importance only as confirming the diagnosis, and not as a method of offering any hope for cure, and indicates that surgical procedure is beyond offering any important aid for the cure of the patient. Pleural fluid when submitted for histologic study by the laboratory worker should be collected in 2 per cent sodium citrate solution.

SUMMARY

Carcinoma of the lung is recognized more frequently than in the past. This may be due in part to the more careful study of the case from the clinical and more especially the pathologic point of view.

DISCUSSION

Dr. Isidore Cohn (New Orleans): The first thing I would like to emphasize is the fact that we must become cancer-of-the-lung conscious. Until we do all the talk in the world will do no good.

Physical diagnosis alone does not enable us to make a diagnosis of cancer of the lung; the roentgen ray plus the aid of the bronschocopist will give the most valuable information. When the pleural exudate contains cancer cells it is too late to do any surgery. Roentgen ray and radium are only palliative and no case has been reported cured by roentgen ray or radium alone. Surgery alone offers the possibility of cure provided the diagnosis is early enough, and if, when one goes in, he does a complete job. Before we decide to operate, the skeleton must be examined to see if there are metastases.

Rosedale and McKay have studied a series of 57 bronchiogenic carcinoma; 51 occurred in whites and six in the colored race; 52 occurred in males and five in the female sex.

In a study of 36 cases they found that the right lung was involved in 20 cases, the left in 16 cases. There was a bronchial constriction produced by tumor in 22 cases. A review of their cases also showed a widespread distribution of metastases from primary bronchiogenic carcinoma.

In my own experience I have seen metastasis to the skeleton, liver, heart, kidney, and of course to the mediastinal lymph nodes.

Patients often present themselves with carcinoma of the lung and yet the diagnosis has not been suspected because the cough has been interpreted as an evidence of either influenza or tuberculosis. Often times there is a pleural transudate which is not bloody. From this pleural transudate by centrifuging the specimen and sectioning the material so obtained, differential diagnosis of growing carcinomatous cells can be found.

The roentgen ray appearance of primary carcinoma of the lung differs from that of metastatic lesions. The primary carcinomatous lesion is usu-

ally a circumscribed hilar shadow. Metastatic carcinomatous lesions in the lung are usually the "snow ball" type. Practically all carcinomas of the lung are bronchiogenic in type.

The greatest problem in the handling of carcinoma of the lung is early diagnosis. We have to get away from the idea that a patient with a cough is either a tubercular patient or one who has had influenza. The bronchoscopist should be consulted and asked to obtain a biopsy if sputum examinations are persistently negative. Surgery offers the only hope in cases of carcinoma of the lung. Roentgen ray and radium treatments are merely palliative and there is not a single recorded case of cure by roentgen ray and radium. There are recorded many cases in which an entire lung has been removed and the patient apparently remained well.

Dr. W. A. Wagner (New Orleans): Just as Dr. Lanford said, I must agree that roentgen ray and radium are of very little value in malignancy of the chest and lung. If the malignancy involves a bronchus or one lung, lobectomy or pneumonectomy is indicated. Therefore, how are we going to arrive at making a diagnosis on those cases that we might do something for surgically, such as tracheal and bronchial malignancy? Therein I believe is the opportune time for the bronchoscopist to lend his diagnostic assistance.

I have done numerous bronchoscopies and I have seen but one malignancy of the lung suitable to pneumonectomy. At the time I first saw this patient the malignancy was in the right main stem bronchus, and was diagnosed at the first bronchoscopy, at which time a biopsy was made. The diagnosis by biopsy was confirmed by the pathologist, and nothing done by the surgeon. Today such a case would be subjected to pneumonectomy.

Those cases are going to be seen late unless the internist sends the patients to us for bronchoscopy. We must see these patients if we are going to make a diagnosis. There is no question the common bronchoscope can detect these lesions. The only difficulty I found was hemorrhage. I removed a specimen and had quite a lot of bleeding. I packed the bronchus and permitted the pack to remain a few minutes, removed the bronchoscope, and let the patient remain on the table. Before the patient had recuperated from the anesthetic, the bronchoscope was reintroduced and the pack removed, with hemorrhage controlled. That patient died seven months later. Later, he was a subject for deep roentgen therapy as the mediastinum was extensively involved.

If the tumor encroaches upon the lumen of the bronchus it may serve as an obstruction or stop valve, or a check valve, thereby producing respectively an atelectasis due to no ingress or egress of air, or an emphysema due to no egress of air. Therefore, such patients with atelectasis and emphysema in which physical examination, roentgen ray and other laboratory findings fail to disclose a diagnosis, exploratory bronchoscopy is indicated. If during this procedure a neoplasm is encountered, a specimen may be removed for biopsy and its true histopathology determined. Upon the findings, proper treatment may be instituted.

CANCER OF CERVIX*

HAROLD G. F. EDWARDS, M. D.
SHREVEPORT

Cancer today ranks second as cause of death. Cancer of the cervix annually exacts a toll of more than 16,000 women. A study of three hundred cases of cancer of the cervix examined and treated by me during the last year reveals that more than 80 per cent of patients applying for treatment have the disease in an advanced stage. No one will deny that progress has been made in the diagnosis and treatment of cancer of the cervix, yet a study of cases reveals that most of them come too late to be cured; not until symptoms have been present for many months. Hamant and Koenig state some of the main causes of delay: The patient does not know the symptoms of cancer and attributes the bleeding to the change of life. She is not alarmed until she notes pain, weakness, or loss of weight; seeks advice from friends, neighbors or quacks; hesitates to see a physician for fear she may be told she has a cancer or that she must go to a hospital. *The physician fails to examine the patient* or does not study her carefully. Because of poor training, the physician cannot recognize cancer, misses the diagnosis, gives wrong advice, and begins inappropriate treatment.

Bloodgood believed that the important means by which cures can be increased are: (1) Education of women and physicians with regard to the protective value of periodic pelvic examinations, making a diagnosis of early cancer of the cervix at a time before symptoms occur and at a time when a large percentage of cures may be expected; (2) training of

*Read before the Louisiana State Medical Society, Lake Charles, April 27-29, 1936.

skilled radiologists to meet the increasing demands of cancer clinics.

PREVENTION

Cancer propaganda has apparently not yet improved the material handled in my Clinic. Something more than the present method of propaganda must be done.

Cancer of the cervix is, as a rule, preceded by chronic cervicitis. The accidents of labor and abortion frequently terminate in low grade infections of the genital organs and always of the vaginal portion of the cervix. Chronic infections of low grade appear to be the forerunner of malignancy. To prevent cancer of the cervix a diligent search must be made for chronic infections and adequate treatment instituted. Lacerations should be repaired, erosions and cysts should be cauterized.

Periodic examination of the cervix should be done on all patients at least every twelve months. Shiller's test should be used; when positive, it may mean an erosion, a luetic ulcer, a leukoplakia, or carcinoma. A biopsy of this area should be taken and a careful microscopic study made so as to make a correct and early diagnosis.

DIAGNOSIS

It is agreed that the success in treatment of cancer of cervix is almost entirely dependent upon early diagnosis. Early diagnosis such as one based upon early subjective symptoms, symptoms which are such as can be recognized by the patient and of enough importance to cause the patient to consult her physician for advice. Unfortunately, the symptoms of early cancer are so trivial that they fail to attract attention of the patients. Leukorrhea, bleeding and pain are not the symptoms of early cancer, they simply signal the symptoms of a disease which has already become firmly planted in the tissues. Vaginal discharge does not appear until the cancer has grown to sufficient size to cause active congestion and increased activity of the cervical glands. Bleeding cannot and does not make its appearance until the cancerous growth has replaced a considerable amount of tissue and until ulceration has taken place. The cervix is well known to tolerate considerable damage before there is pain, which occurs only as a late sympton. From what has been said it is quite evident that the early diagnosis of cancer of the cervix must depend on something more than symptoms which the patient can recognize. When symptoms occur which the patient can recognize, cancer is already too well established. It is not surprising that so few patients have an early diagnosis made. Early cancer findings are entirely objective and require a microscopic study for diagnosis. The early clinical appearance of cancer of the cervix is a nodule; if of the everting type, this nodule progresses on to a typical cauliflower growth with necrosis and later a sloughing mass leaving a crater behind. If the nodule is of the inverting type then the nodule grows to considerable size and finally ulcerates, becomes secondarily infected and leaves, as a result, a large crater.

The determining of the clinical extent of the disease is of great importance, since it must furnish information upon which treatment must be planned. A careful vaginal examination is necessary to determine the extent of the disease. Early cancer is limited to the cervix and on palpation the uterus is freely movable and devoid of secondary inflammatory signs in the adjacent tissues. Once the disease has become actively growing then the adjacent tissues become invaded with root-like extensions of cancer cells, an infiltration in the paracervical tissues and now the uterus is partly fixed because of the infiltration. When the invasion has extended into the parametrium, the uterus is fixed further because of the loss of elasticity of the parametrial tissue. In the final stage the entire pelvis is "frozen", revealing that the disease has invaded other organs and tissues. Rectal examination will frequently convey more information in stages II, III and IV than vaginal examination and will permit palpation of regional lymph nodes which could not be felt through the vagina.

CLINICAL GROUPS

The clinical grouping of cases of carcinoma is the one recognized in most of the gynecological clinics of the world. It is the Schmitz or League of Nations Classification, and is based entirely upon clinical findings and not surgical ability. The terms, operable, borderline, and non-operable are obsolete and should be discarded forever. The following is the League of

Nations Classification of cases according to stage of the disease:

I. Disease limited to cervix; uterus mobile.

II. Disease spreading into fornices with or without infiltration adjacent to uterus; uterus partially mobile.

III. (a) Nodular infiltration of parametria extending to wall of pelvis, with limited mobility of uterus or massive infiltration of parametrium with fixed uterus.

(b) Superficial infiltration of large part of vagina with mobile uterus.

(c) Isolated metastases in pelvic glands with relatively small primary growth.

(d) Isolated metastases in lower part of vagina.

IV. (a) Massive infiltration of both parametria extending to walls of pelvis.

(b) Disease involving bladder or rectum.

(c) Whole vagina infiltrated, or one vaginal wall entirely infiltrated with fixation of primary growth.

(d) Remote metastases.

V. Cases previously treated by someone else.

PROGNOSIS

The prognosis of a given case of cancer of the cervix depends upon; first, the clinical stage of the disease; second, the age of the patient, and last but not least, the plan of treatment. Young women under 30 years, according to Healey, rarely survive five years. Pain even in the early cases must be regarded as a bad prognostic sign and, when referred to the back, hips and thighs, usually indicates that the disease has already spread to the paravertebral lymph nodes.

Within the past few years much has been written about the prognostic value of the histologic grade of the tumor to be treated. At present, it may be said that the radiosensitiveness of the different histologic forms of cancer of the cervix is still unsettled, although the results being secured tend to support, to some extent, the biologic relation between anaplasia and radiosensitivity The results secured in treatment of the four tissue grougs are practically the same; there does appear a small difference between the adenocarcinoma group and the epidermoid group of marked anaplasia. Tissue grading alone seems to be of little prognostic value. However, histologic grading is of great value in determining the radiosensitivity of the tumor and determining whether or not metastasis is likely to occur.

TREATMENT

Surgery: Today one never finds the old fight frequently brought out when the question of radium or surgery in treatment of cancer of the cervix is discussed. Only a few advocates of the surgical plan are left. It is generally conceded that operation is justified in only the very early stage, at which time the disease is confined to the cervix and the uterus is freely movable with no invasion into the vaginal vault or parametrium. Hysterectomy for the cure of cancer of the cervix is said to have been performed as far back as the year of 1600 A. D. Since that date the operation has been improved until the Wertheim plan of abdominal hysterectomy, published in 1895, which involved complete dissection of the parametrial lymphatics with the upper half of the vaginal tube, the uterus, tubes and ovaries. It was once regarded by all gynecologists as the best surgical procedure in the treatment of cancer of the cervix. It is a very difficult operation; it must not be confused with an ordinary hysterectomy. Wertheim's five year cures amounted to 43 per cent and this did not take into account the operative mortality of 16.6 per cent. Bonney, in his most recent publication, reports 41 to 42 per cent cures, with an operative mortality of 20 to 14 per cent and this must be taken from cure rate, finally having only 31 to 32 per cent cures in the operable cases. Taussig, in 1912, reported his operative mortality at 39 per cent; recently his mortality has been reduced, and his cure rate on 43 cases as 60 per cent with two operative deaths, all of these cases were in Group I.

Healey, Schmitz, Watson, Curtis, Ward and many leading American gynecologists all unhesitatingly state that surgery is not the method of choice in the treatment of cancer of the cervix. Nevertheless, there is still found an operator here or there who can not refrain from hysterectomy, despite the poor results which accompany it.

Combined Surgery and Radium: The recent

publications of Gellhorn, Curtis and Taussig, wherein they advocate coincidental surgical exposure and radium therapy, certainly represents a surgeon's dream, a radiologic nightmare and reflects a lack of knowledge of the physics of radium therapy. Such combination of methods does not lead to the road of success.

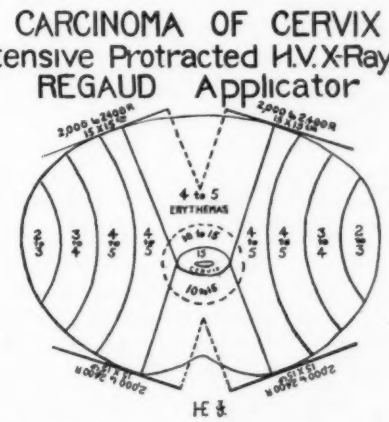
Radiation Therapy: In 1913, the medical literature began to contain articles from European centers reporting the splendid results which had been obtained from the application of radium in advanced cases of cancer of the cervix and vagina. So striking were the results that soon more favorable cases were given radium treatment and lastly the early cases which would have been regarded as suitable for the Wertheim operation were treated with radium. From here on the leading gynecologists throughout the world began to employ radium in the treatment of cancer of the cervix.

Healey found that certain factors were responsible for bringing about this rapid acceptance of radium in the carcinoma of the cervix situation, that carcinoma of the cervix, it was known, had the peculiar characteristic of remaining localized for a long time in or near its primary site in the pelvis, that it rarely threw out distant metastases but always recurred in the parametrial lymphatics or in the paravaginal tissues. It was at once evident that here was a lesion that could be irradiated at its primary site and also its adjoining lymphatics. Soon it was found out that carcinoma of the cervix was a disease which, in a large proportion of the cases, was quite radiosensitive.

Results of radium treatment of cancer of the cervix have shown a steady improvement during the last few years, due to improved radiation technic. Lacassange states that the percentage of cures in cancer of the cervix in the Curie Institute is 75 per cent for Group I; 50 per cent for Group II; 25 per cent for Group III; Schmitz, Group I, 84.7 per cent; Group II, 47.62 per cent; Group III, 19.16 per cent; Healey, early Group, 55 per cent; Heyman, Radiumhemmet, shows 16 per cent cures in inoperable and 44.4 per cent cures in the operable group.

The progress of radiation therapy of cancer of the cervix has been slow and orderly, each period has shown an attempt to deliver a maximum amount of radiation to the cancer cells with a minimum effect on normal tissue. With progressive improvement in radiation methods there has been observed a gradual increase in the per cent of five year cures. Today the leading cancer therapists and gynecologists are all striving for the same goal and, although showing slight variation in technic, they each embody the principle of delivering a lethal dose of radiation to the cervix, parametrium and pelvic glands by means of high voltage x-rays to the pelvis and adequately distributed, heavily filtered radium in the uterine canal and vaginal vault. A study of the methods employed by these eminent gynecologists is fitting evidence that adequate radiation does not mean merely inserting a capsule of radium in the cervical canal for twenty-four or forty-eight hours.

In the continuing search for improvement in the treatment of cancer of the cervix, any modification of method that holds out real hope of giving the patient a better chance of cure should be seriously studied. For some years past, world-wide attention has been drawn to the method of radium treatment developed by Dr. Regaud of the Radium Institute of Paris. This method is based on the purpose of delivering a dose of rays to each generation of cells



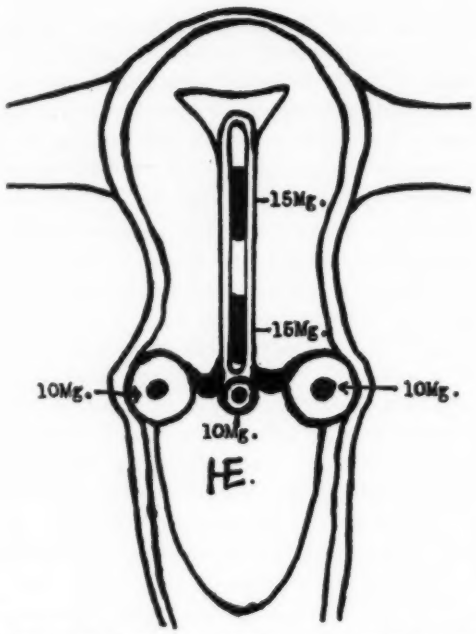
at that stage of cell-division when the cell is most radiosensitive, and this is accomplished by protracting the delivery of the dose over from four to six days. In my own exper-

ience, I have been favorably impressed with this method.

It is impossible to lay down a routine method of radiation treatment for all cases of cancer of the cervix. The radiologist must be versatile enough with the weapons which he employs to vary his plan of treatment whenever the case demands, if best results are to be secured. In a large number of cases I have used a cycle of high voltage x-ray 1,000 r/o to each of four pelvic fields, administered in a period of five days, followed, usually immediately, by application of radium, giving a total of 6,000 to 8,000 mg. hours.

Radium applied in the uterine and cervical canal, against the cervix and in the vaginal vault, is not effective in destroying cancer cells more than a few centimeters distant from the site of application of the radium. It follows that the primary disease of the cervix is controlled or cured, but the parametrial disease is not controlled and the retroperitoneal lymphatics are not sufficiently irradiated. This fault in the old treatment has prompted Healey to advance a new plan of high voltage x-ray therapy in order to obtain greater intensity of radiation in the pelvis. With slight modifications, I have been using this method in the treatment of cervical cancer and have found it of inestimable value in stages I, II, and III. I employ four fields, two anterior and two posterior, each 15 cm. square, and administer 200 r/o to each anterior field on one day and to each posterior field on the next day. From ten to twelve such treatments are given to each field, a total of from 2,000 r/o to 2,400 r/o to each area. Usually immediately after the completion of this series of x-ray treatments, radium is applied in the vagina and cervix with a modified type of Regaud applicator, with filtration, with 1 mm. of platinum in the cervix and uterine canal and 1.5 mm. of platinum in the vaginal portion. The applicator is held securely in position by wide gauze packs well saturated with a solution of acriflavine 1:1000 and left in place throughout the period of application of the radium, which is from four to five days, a total of 7,500 mg. hours.

The intensive protracted application of fractional x-ray doses to the pelvis is calculated to produce approximately four to five erythema doses in the parametrium, and, when supplemented by the radium application, from 10 to 15 erythema doses at the cervix and the surrounding 5 cm. of tissue. This type of intensive treatment is unsuited to the more advanced stage IV or even to some cases of stage III. Any attempt to use this method in these cases usually proves disastrous, because of the infection and anemia that are present and the poor general condition of the patient. The treatment must be well planned, for if it is carried through and fails, the door to all future irradiation is closed.



Modified Regaud type applicator showing distribution of radium.

IRRADIATION OF THE PARA-AORTIC LYMPHATICS

A review of the literature reveals that spread of lymph gland metastasis is manifested beyond the iliac crests, beyond the irradiated pelvis in approximately 10 per cent of cases, the lumbar aortic nodes and glands over the common iliac vessels are the glands involved below the diaphragm. A study of our autopsy material of a large number of patients dying from cancer of the cervix shows that many patients have had the disease cured or arrested in the pelvis

or treated area and have died from the results of metastatic nodes above the brim of the pelvis. This has led me to employ an original thought, to irradiate the para-aortic lymphatic area. This series of high voltage x-ray treatments is usually instituted two months following the radiation to the cervix and pelvis, employing two anterior and two posterior fields from below the diaphragm to the iliac spine.

Palliative measures must be resorted to for patients who come to the cancer therapist with far advanced lesions. Patients in stage IV are in this group. The control of bleeding, attempting to minimize infection, and decreasing the foul discharge, with relief of pain is about all that may be expected. Radiation therapy in the form of external high voltage x-rays in careful, moderate dosage will do much towards arresting the bleeding and decreasing the discharge, as well as affording some relief of pain. Heavy radiation dosage is to be avoided if best results are hoped for, indeed many patients in stage IV do better without radiation. When there is severe pain due to metastasis to the pelvis and lumbar lymph nodes, morphine may not afford relief; then subarachnoid alcohol block should be tried. This form of treatment in my hands has given relief to a small group of unfortunates. It is well worth a try for if care is taken and cases are properly selected no harmful results have been observed.

	Stage I	Stage II	Stage III	Stage IV	Stage V	Total
White	13	30	31	26	18	118
Colored	11	28	50	93	0	182
Epidermoid:						
Ca. Grade 1	1	0	0	3	0	4
Ca. Grade 2	13	36	42	68	5	164
Ca. Grade 3	4	11	28	33	1	75
Ca. Grade 4	1	0	1	5	1	8
Ca. Not Graded	4	8	7	8	3	30
Adenocarcinoma	1	4	3	2	0	10
No Biopsy	0	0	0	2	7	9

The foregoing table represents a study of 300 cases of cancer of the cervix treated during 1932-1935, showing race, stage of the disease and histologic grade of the tumor. No attempt is made in this study to evaluate five year cures. This series has been treated by methods indicated in text of this paper and sufficient time has not elapsed properly to evaluate results.

SUMMARY

The complications of cancer of the cervix are numerous and are not discussed in this paper. Complications following application of radium have not been troublesome and the mortality has been nil, while the morbidity has been low.

DISCUSSION

Dr. P. W. Winder (Shreveport): I am particularly happy to discuss Dr. Edwards' paper because I have had the privilege of seeing the splendid work he and his staff have been doing, and have personally examined a number of the patients they have treated and in this manner have seen the results. I am comparing his results with 315 that were carried out by the gynecological staff at the University of Michigan hospital.

I am particularly impressed with his results, not only from the mortality side but from the morbidity side. He has had a very low incidence of skin manifestations from irradiation, proctitis due to irradiation, or cystitis. He has never had a case of spontaneous fracture of the neck of the femur from irradiation. We are dealing with many patients who have a markedly lowered resistance which makes the morbidity side of great importance.

Early carcinoma of the cervix may be said to have no symptoms. Every female patient has a slight amount of vaginal discharge, but to call that a symptom is, to me, a fallacy. Cancer of the generative tract is the most common cancer of the female, and cancer of the cervix leads the list. We do not know which, if any, of the common cervical lesions is the true forerunner of the cervical cancer, but there are certain facts so well established that it is difficult to overlook. Thus it is generally agreed that cancer never begins in healthy tissue, that it is always local in its incipiency, and that there is always a precanerous stage, although this lesion cannot as yet be named.

If these things be true, and I believe they are, there is no excuse why every common lesion of the cervix should not be viewed with suspicion and treated until cured. It is only by recognizing these facts and seeing to it that every patient who consults us has or is made to have a healthy cervix that we can make headway in the prevention of cervical cancer. It is these simple means which are available for treating these conditions that make therapeutic vacillation out of the question.

The American College of Surgeons, at their annual congress, reported authenticated cases of 500 cures, and this number has now reached the total of 24,440. In the group surveyed at Michigan

they estimated that if the knowledge of the cause and cure of cancer was utilized fully by the laity and by the medical profession, approximately 30 to 50 per cent of these deaths could be prevented. Their major emphasis was placed, in the control of this disease, on early diagnosis and early treatment, both of which were mentioned in Dr. Edwards' paper.

In regard to treatment, it is generally agreed that radiation therapy is the treatment of choice, even in the very early group of cancer of the cervix. A procedure frequently done in the massive reverting type of cervical cancer is to cone out the cauliflower-like mass and then apply radium, for the reason that this gives better irradiation. In my short experience, this has only caused detrimental results and is practically no good.

I think Dr. Edwards mentioned an important item when he said you cannot make or give a standard treatment in the use of radiation therapy for the treatment of cervical cancer. Each patient presents a treatment problem and, as he mentioned, this treatment is based on the physical condition of the patient, the extent of the disease, and the cellular type of the neoplasm.

Dr. William R. Mathews (Shreveport): This report of Dr. Edwards, like most clinical studies on cancer of the cervix, emphasizes the necessity for early diagnosis. Eighty per cent, or more, of patients with cancer of the cervix are in a relatively advanced stage of the disease when a positive diagnosis is made. This means, of course, that the great majority of patients with cancer of the cervix, when seen by the physician who makes the diagnosis and institutes adequate treatment for the disease, fall into the group receiving palliative results and not cures.

The clinical determination of the extent of disease in its early stage faces limitations and is only approximately correct. It is a common experience of the physician treating cancer of the cervix to find among his cases adjudged clinically as stage I, clinical evidence of pelvic and distant metastases several months, or years following cure of the primary lesion. This means that cancer cell emboli were already in the intrapelvic nodes and the parametrial tissue but could not be detected. In outlining treatment, one must anticipate this possibility, however early the cervical lesion may appear.

If we are to make any significant advance in the treatment of carcinoma of the cervix, as well as cancer anywhere in the body, the diagnosis must be made in the early stage of the disease. This must be done in the majority of cases when a clinical diagnosis of cancer is not definite, but requires a biopsy to establish a positive diagnosis.

PREOPERATIVE RADIATION OF CANCER OF THE BREAST*

LEON J. MENVILLE, M. D.
and
J. NOVELL ANE, M. D.
NEW ORLEANS

The mortality rate for cancer of the breast varies in different parts of the United States, the larger percentage of five-year clinical cures being obtained where the disease is treated by experienced physicians. Even where the best results are reported the mortality rate still remains high, and there is but little doubt that it can be materially reduced through a better understanding by the medical profession of the mode of application and effect of irradiation therapy.

While radical amputation is the treatment most often used in operable cancer of the breast, the conjoint use of radiation therapy, preoperatively and postoperatively, has proved of great value, and is now the most favored form of treatment of cancer of the breast.

The use of radiation therapy preoperatively in cancer of the breast is apparently not well understood by members of the medical profession in certain localities. That it does play an important part in the increased number of five-year clinical cures is known generally by the radiological profession.

Pfahler[1] has shown that when preoperative radiation was given to a group of patients suffering with cancer of the breast, 62 per cent were living after three years, and 50 per cent were living after five years. Quick[2] believes that preoperative radiation is probably of greater relative value than postoperative radiation. Soiland[3] has forcefully expressed himself in regard to the beneficial effect of preoperative radiation; in fact he states that it is the first line of offense in the treatment of carcinoma of the breast and that this form of therapy should be used in all cases.

On the other hand, we find some prominent physicians who, while advocating this form of therapy, have assumed a more conservative at-

*Scheduled to be read before the Louisiana State Medical Society, Lake Charles, April 27-29, 1936.

titude toward its use. For instance, Cutler[4], of the Tumor Clinic of the Michael Reese Hospital, Chicago, has recently stated that he utilizes preoperative radiation in selected cases as follows: (a) in very young women in whom the clinical setting is such that it leads one to suspect the existence of a highly malignant anaplastic carcinoma, a type in which the results of surgery alone have been extremely unsatisfactory, and (b) in lesions of borderline operability. He further states that "the circumstances that appear to favor the use of preoperative radiation are as follows: (a) the fact that surgery alone yields only 30 per cent five-year cures; (b) the probability that the mechanical trauma incident to the surgical procedure disseminates cancer emboli, and that this danger might be diminished by the use of preoperative radiation; (c) the existence of a small but definite proportion of cancers of the breast which are radiosensitive, with the probability that these types are also highly malignant."

The objections offered by Cutler to the use of preoperative radiation can be summarized as follows: "(a) the possible dangers of dissemination during the waiting period between the first radiation and the surgical removal of the breast; (b) the increase in difficulty of the surgical procedure and interference with postoperative healing if adequate radiation is used; (c) the relative radioresistance of mammary cancer to doses of radiation which will still permit the safe execution of the surgical procedure."

Adair[5], attending surgeon of the Memorial Hospital, New York City, recently published an interesting article on preoperative irradiation in primary operable cancer of the breast. In his article, he apparently does not agree with the objections offered by Cutler, namely, "the possible dangers of dissemination during the waiting period between the first radiation and the surgical removal of the breast." Adair expresses himself very convincingly in this report. "If preoperative radiation is effective, it is necessary to allow two months as a mimimum after the completion of the treatments for radiation to become fully effective in producing the desired tissue changes. The direct killing effect on the more sensitive cancer cells, together with the slower development of fibrosis and endarteritis and other results of radiation, consumes a period of at least eight to ten weeks. Many clinicians will object to this delay, believing that the rate of tumor growth exceeds the rate of tumor starvation and strangulation secondary to radiation. This view is understandable, but in our study it is obvious that the rate of tumor destruction far exceeded the rate of tumor growth, while the radiation was being carried out. This period of delay therefore seems justified. We are fully cognizant of the opinions of some who believe that after a diagnosis of cancer is made, immediate operation is imperative."

Certain interesting observations were made by Adair regarding preoperative radiation of operable cancer of the breast. In this regard, he says, "This research here presented shows that one group of mammary cancer cases, the operable, heretofore generally held to be a surgical problem only, may now be considered also a problem for the radiologist".

In this study of preoperative radiation effects, Adair says, "It must be stated in the beginning that in every instance there was a positive biopsy report of cancer of the breast. We recognize that there are those who consider that aspiration biopsy material is not as satisfactory as biopsy material obtained by incisional methods. However, we make no apologies for this form of biopsy so freely used in our institution. It is a method satisfactory to our pathologists—Dr. Ewing and Dr. Stewart. Its interpretation requires special study and great experience along these lines. In the hands of the competent, this method is steadily gaining in general acceptance.

"Without this method of biopsy it would have been impossible to make this study: first, because physicians will not accept the clinical diagnosis of others on a case of cancer; second, and especially, because the recent scar of the incisional biopsy breaks down under the heavy radiation delivered, making such full radiation impossible. Aspiration biospy is, therefore, an important step in the work here reported."

Adair's study is based on 117 cases of oper-

able mammary cancer. Each case had: (1) positive biopsy; (2) preoperative irradiation; (3) followed two or three months later by (4) a radical mastectomy and (5) careful tissue studies. Of this number, 65 cases were treated through five portals by the fractionated dose method, using the 200 kv. roentgen machine, giving 300 r daily to each of two portals. Fifty-one cases were treated similarly using the 4 gram radium element pack and giving 8,000 mc-hr. to one portal per day. The portals used in both series were one tangential to the breast medially and one tangential to the breast laterally, thus cross-firing the breast lesion from two directions. The axilla was cross-fired through three ports; (a) axilla and supraclavicular anteriorly; (b) axilla direct, (c) axilla and supraclavicular posteriorly.

Adair says, "The clinical results of therapy were tabulated thus: (1) breast tumor same size; (2) breast tumor reduced in size; (3) residual thickening only; (4) breast tumor entirely gone. Of the 18 cases treated by roentgen radiation giving 1,800 r per portal, there was not one instance in which the tumor remained the same size as originally described. In other words, radiation, if given in fairly large doses, practically always causes reduction of the size of the tumor in varying amounts, depending on the type of pathologic process present. Anaplastic carcinoma usually completely disappears, while colloid carcinoma changes very little in size. Of these 18 cases clinically examined, there was reduction in size or disappearance of the tumor in all cases." He reports that with the treatment used, he obtained five-year clinical cures in three out of four cases when the disease is confined to the breast alone, and one in four when the axilla is involved. Irradiation greatly softens the breast tumor so that at times it becomes extremely difficult for the clinician to be sure that any tumor remains. The characteristic hardness of the cancer entirely disappears so that the breast seems of the same consistency throughout.

Adair says further: "When the amputated breast is examined in the laboratory, the pathologist has a new and difficult problem locating the tumor or its residual scar. It usually becomes necessary to locate the original site of the tumor by cutting the breast in small parallel slices. Ewing and Stewart frequently locate the original site in difficult cases by noting: (a) a sclerosed hyalinized area; (b) a puckered scar, or (c) a few yellowish streaks. The consistency of this area is soft and differs from untreated carcinoma of the breast. A section taken from this type of material sometimes shows no residual cancer; at other times only a few clusters of atrophic degenerating cancer cells so badly damaged that their viability is in great doubt; while, on the other hand, the microscopic study may reveal fully stainable and possibly viable cancer cells. It is difficult for the pathologist to be correct on his gross study of the breast material and the axillary contents. Gross and microscopic tissue studies require that one have experience in this special field of radiated tissue".

Apparently there are differences of opinion in regard to preoperative radiation and its interference with surgical procedure which conflict with Cutler's opinion. May [6] mentions that preoperative radiation does not make subsequent operative procedure more difficult or dangerous and states that Jungling in a series of such cases has shown this to be true.

The proponents of preoperative radiation maintain that if radiation therapy applied postoperatively is capable of destroying residual cancer cells, it should have even more effect on such cells when given as a preoperative measure. The late Joseph Colt Bloodgood[7], a strong exponent of preoperative radiation for cancer of the breast, shortly before his death sent to us a report of three interesting cases of breast carcinoma treated preoperatively by radiation therapy. He proves that the contention of those who advocate preoperative radiation is as vulnerable as the arguments of those who favor postoperative radiation. One of the three cases reported had received preoperative radiation therapy three months before a complete operation for cancer was performed. Culture of the tissue taken at operation showed a definite growth of living cells, but the glands microscopically showed no involvement. The other cases had received adequate preoperative radiation with a negative culture growth. Blood-

good stated that "apparently we have sufficient evidence to demonstrate that the moment radiation starts on a breast cancer and its metastatic area, there is no further growth of cancer cells in the cancer nodule, and no growth of cancer cells in the metastatic nodules." He also stated that "when women are properly instructed to report for examination within two weeks after the appearance of a lump in the breast and when all receive preoperative radiation, if there is any sign of malignancy, the danger of cancer of the breast will become more and more insignificant."

While we appreciate that all competent radiologists are familiar with the usual number of fields to be radiated, we would like to call attention to one of these fields which is extremely important, but is usually given perhaps less attention than any of the others. We have in mind the supraclavicular area. Leddy and Desjardins[8] have pointed out that frequently carcinoma of the breast metastasizes to the supraclavicular lymph nodes. This they consider as a bad sign because it seems to precede metastasis to the liver and lungs.

It is to be hoped that with a better understanding by the medical profession of the efficacy of this mode of treatment, breast carcinoma cases will be given a better chance for recovery.

REFERENCES

1. Pfahler, G. E.: Quoted from May.

2. Quick, Douglas: Radiation in primary operable breast cancer, J. A. M. A., 101:2091, 1933.

3. Soiland, Albert: A radiological concept of the treatment of cancer of the breast, Radiology, 21:498, 1933.

4. Cutler, Max: Cancer of the breast, Canad. Med. J., 32:382, 1935.

5. Adair, Frank E.: The effect of preoperative irradiation in primary operable cancer of the breast, Am. J. Roentgenol. and Rad. Ther., 35:359, 1936.

6. May, Ernest A.: Methods of roentgen treatment in carcinoma of the breat, Radiology, 21:420, 1933.

7. Bloodgood, Joseph Colt: Personal communication.

8. Leddy, E. T. and Desjardins, A. U.: Metastasis of carcinoma of the breast to the supraclavicular lymph nodes, Am. J. Cancer, 25:611, 1935.

POSTOPERATIVE PULMONARY COMPLICATIONS*†

J. ROSS VEAL, M. D.,
and
BENJAMIN DEKALB VAN WERDEN, M. D.
NEW ORLEANS

Within the last fifteen years, and more specifically within the last ten years, increasing attention has been paid to the importance of postoperative pulmonary complications. In spite of this increased emphasis, however, they are still occurring with monotonous regularity. The incidence is variously estimated. Lee in 1924 estimated that one in every 50 surgical patients is likely to develop such a complication, and that one in every 150 or 175 patients who develops it will die, a mortality of approximately 0.6 per cent. Eliason, in a comprehensive study in 1932, estimates that pulmonary complications occur in from 1.5 to 3.5 per cent of all surgical cases, and that the mortality varies from 3.3 per cent to 0.7 per cent. That means, as he goes on to explain, that approximately one in every 200 patients submitted to surgery will die of this complication. The importance of the subject, therefore, is self-evident.

It is not too much to say that the whole conception of postoperative pulmonary complications has changed in the last fifteen years. In the first place, the anesthetic is now regarded as of much less importance. Formerly all postoperative pulmonary complications were attributed to inhalation anesthesia. Now thoughtful surgeons know that such mischances are quite as likely to occur after one variety of anesthesia as after another, if, indeed, they are not more frequent with the spinal and regional varieties. They know, too, that in many cases the anesthesia cannot be blamed at all. Thoughtless surgeons, of course, still have a tendency, as Pemberton expresses it, "to attribute to the anesthetic or to its mode of administration any unusual complication which cannot be readily explained otherwise." In the second place, the incidence of pulmonary complications after

*Read before the Orleans Parish Medical Society May 25, 1936.

†Based on a study of 3364 abdominal operations from the records of Charity Hospital in New Orleans.

operation has almost invariably shown an increase when surgeons have devoted themselves to the subject, though with the increased incidence has usually gone a decrease in the mortality. The explanation is not difficult: better diagnosis and more careful observation explain the increase in incidence, better prophylaxis explains the decrease in the mortality. In the third place, in spite of the point we have just made, that better prophylaxis has brought about a decrease in the mortality, the state of affairs is still highly unsatisfactory. No single method, no combination of methods, has proved really effective in reducing the incidence of such complications. Under certain conditions, with certain types of patients, and with certain types of operation, the incidence of postoperative pulmonary complications has shown practically no decrease, even in the hands of men who have paid constant, careful attention to the subject, and the mortality in such cases has, as was to be expected, remained almost what it was.

Postoperative pulmonary complications fall into three general groups: the infectious, which includes pneumonia, lung abscess and similar conditions; the atelectatic, which includes both the massive variety of collapse and the lobular and lobar varieties; and the vascular, which includes infarction and embolism. Acute pulmonary edema is frequently classed with the latter group, but it is best regarded as an incidental complication, so to speak, since it is really only another manifestation of cardiac failure. It is frequently the main contributing factor in the fatality, but it is not, strictly speaking, a pulmonary complication.

The infectious group of complications is so clearly understood that little attention need be paid to it, except to point out once again that it is considerably smaller than it once was, not because the actual incidence is less but because methods of diagnosis have been so greatly improved. It might be added, too, that in this group of cases the etiologic factor is very often a pre-existing infection of the respiratory tract. No amount of later solicitude, as Wharton says, can atone for operating on a person with a cold, bronchitis or some similar condition, and this same author emphasizes the importance of waiting for complete recovery, which does not take place, he reminds one, in two or three days.

The other two groups of complications need more extended consideration. The vascular group, which is divided into two sub-groups, the infarct group and the embolic group, is not, in one sense, a pulmonary complication at all. It is a vascular accident, resulting from surgery it is true, and localized in the lungs, but not due, strictly speaking, to a pulmonary condition.

In pulmonary infarction the symptomatology, clinical course and outcome depend upon the extent of pulmonary involvement. This condition was unknown, or, more correctly, unrecognized until 1920, when Wharton of Johns Hopkins detected it and comprehended its significance. During a study of phlebitis in gynecologic patients he observed that a number of these women developed pulmonary conditions diagnosed as pleurisy or pneumonia, that some of them had repeated attacks, and that a small percentage of them eventually died of embolism. Studying these patients carefully, particularly at the postmortem table, he was able to demonstrate that the condition from which they were suffering was actually not pneumonia or pleurisy but pulmonary infarction, the result of showers of emboli which are the constant result of all operative procedures involving the blood vessels. His clinical observation showed him that while the complication usually occurred from the fifth to the fourteenth day after operation, it was always more serious if it occurred during the first week, before the irritation of the anesthetic had disappeared, before the patient had regained her strength, and when, as was later demonstrated, the atelectasis and hypoventilation which follow so many surgical procedures were at their height. In such circumstances, as he pointed out, pulmonary infarction is a serious matter and may even terminate in lung abscess. Eighty per cent of these cases occur in the right lower chest. The clinical picture of pain, a rise in temperature and pulse-rate, sometimes blood-tinged or frankly bloody sputum, differs entirely from the clinical picture of pneumonia, with its high fever, distressing cough, and purulent expectoration. The physical findings are also different, particularly in the early case, and roentgen ray shows the typical triangular

shadow of an infarct. Recovery is the rule in mild cases and even in the more severe cases is not a fatal complication unless embolism occurs or it goes on to lung abscess.

The massive type of embolism is so well known that a description is scarcely necessary. There is no more dramatic happening and no greater tragedy in surgery than this bolt from the blue which usually occurs in patients whose convalescence has been smooth or has been marked by little more than a mild rise of temperature or perhaps an associated phlebitis. A few cases are on record in which the heroic measure of embolectomy has saved the patient's life, but the usual outcome is death even before surgery can be attempted. It is a tragedy which, as Robertson says, has defied all efforts to foretell it, to prevent it, to explain its cause, or to alter its outcome.

Concerning the atelectatic group of pulmonary complications after operation a great deal has been learned. This is a condition which was practically unknown fifteen years ago, but which now is believed to be the most frequent of all postoperative pulmonary complications, and which is present, either actually or potentially, after most abdominal operations, particularly after most upper abdominal operations. The studies of Graham, Muller, Overholt and Pendergrass, Sise, Mason and Boland, Churchill and McNeil, and others too numerous to mention have shown very clearly that after operations on the abdomen, and particularly after operations on the upper abdomen, definite anatomic changes occur, chiefly a marked elevation of the diaphragm, frequently with fixation, particularly on the right side; a marked reduction of chest expansion, with narrowing of the intercostal spaces, so that respiration is largely carried on in the anterior and upper portions of the lungs and there is a marked hypoventilation of the posterior and lower lobes; and, as a result, a marked reduction in the vital capacity of the lungs, which varies from 20 to 70 per cent after lower abdominal operations and from 50 to 80 per cent after upper abdominal operations (Churchill and McNeil).

In addition to these anatomic changes, other factors are operative. There is an increase in bronchial secretion after operation, the cause and mechanism of which are not clearly understood. There may be a pre-existing infection in the air passages. The tight dressings and abdominal binders which are so frequently applied further compress the lower chest. The patient tends to restrict his breathing voluntarily, to spare himself pain. The tendency to quiet, shallow breathing is increased by the use of narcotic and sedative drugs. In short, as one considers these various factors, the wonder is not that the vital capacity is altered in some cases after operation but that it is not altered in all.

In the massive variety of atelectasis, as Snyder points out, the picture is one of catastrophe. The onset is usually within forty-eight hours of operation, though it may be later. There is a sudden elevation in temperature, pulse and respiration. Dyspnea is present and sometimes cyanosis. Frequently the patient makes futile efforts to cough. The facies is anxious. There is severe pain in the chest or upper abdomen. There is limited expansion over the affected area, often with retraction of the interspaces, and increased expansion of the opposite side. The heart is displaced, sometimes to the right chest. The physical findings, as Hawks and Klotz emphasize, vary from hour to hour, and this variability is their outstanding characteristic. In the milder types the symptoms are the same, but correspondingly milder, and so are the physical findings, and, since the areas of involvement are scattered and limited, the condition may be entirely overlooked unless it is diligently sought for or unless the roentgen ray is employed. Indeed, it is to the use of the roentgen ray that the apparently increased incidence of atelectasis is due. There is small doubt that a large proportion of the postoperative complications formerly diagnosed as pneumonia are actually due to this condition. King, for instance, points out that in his own series only one-fifth of the postoperative pulmonary complications were attributed to atelectasis in 1928, whereas in 1931, after he had begun to look for the condition, two-thirds of the cases were so recorded. This same author by the way, points out another important consideration, that it is quite possible

for the atelectasis to persist after the causative bronchial occlusion has been relieved, in which case the signs change from those of dullness, absent or much diminished breathing, absent or diminished voice, and diminished whispered and tactile fremitus, to those of consolidation.

We realize, as King has emphasized, that in the study of postoperative pulmonary complications personal observation is far more accurate than a study of hospital records. But at that, a study of records can still be helpful, and for that reason we have undertaken such a survey in the New Orleans Charity Hospital, confining our investigation to abdominal operations, since other observations [1] have already made clear the relative insignificance of such complications in extra-abdominal surgery.

We reviewed in all 3,364 abdominal operations, of which 1668 were performed for upper abdominal conditions and 1696 for lower abdominal conditions. In the whole group there were 141 definite pulmonary complications, 4.19 per cent, of which 81 were in the upper abdominal group, an incidence of 4.85 per cent, and 60 in the lower abdominal group, an incidence of 3.35 per cent. This is a less striking difference than is usually apparent in the two groups. But the difference in mortality is very striking. The mortality for the whole group of 141 cases is 37, 26.2 per cent. The entire mortality, however, occurred in the upper abdominal group of 81 cases, which gives a mortality of almost 47 per cent for that group, against a zero mortality for the lower abdominal group. It might be added that autopsy was done in 23 of these cases, and that the pulmonary complication was established either as the cause of death or as the most important contributing factor.

In the upper abdominal group 920 patients were operated on under spinal analgesia with 37 complications, an incidence of 4.02 per cent, and 130 under spinal analgesia plus some supplementary type, with 11 complications, an incidence of 8.46 per cent. Five hundred forty patients were operated on under inhalation anesthesia with 24 complications, an incidence of 4.44 per cent, and 78 under local or splanchnic analgesia with 9 complications, an incidence of 11.53 per cent.

In the lower abdominal group there were 1127 spinal analgesias with 40 complications, an incidence of 3.4 per cent; 373 inhalation anesthesias with 9 complications, an incidence of 2.41 per cent; and 165 local analgesias with 11 complications, an incidence of 6.66 per cent. It is clear from these figures that the use of anesthesia other than the inhalation type is no protection whatsoever against the development of pulmonary complications.

Pulmonary complications of a mild type include lobular atelectasis, with or without small areas of pneumonitis, bronchitis, and small areas of pneumonia. Complications of a severe type include bronchopneumonia, massive collapse of the lungs, pulmonary infarction and pulmonary embolism. Looking at the cases we have studied from this aspect, we may say that in the lower abdominal group only 14 patients had severe complications, against 44 mild ones, while in the upper abdominal group there were 60 severe complications, 37 of which were fatal, and 21 mild complications.

Seventy-four of these complications occurred during the fall and winter, 67 during the spring and summer, which is not a significant seasonal difference. The difference in the mortality, however, is decidedly more striking. Twenty-three of the 74 fall and winter cases terminated fatally, 31.8 per cent, in contrast to 14 fatalities in the 67 spring and summer cases, 20.7 per cent. The mild, sub-tropical climate of New Orleans is apparently no protection against the development of pulmonary complications or their fatal outcome.

One or two other considerations might be mentioned. The average age of the patients in the lower abdominal group was 35.2 years, against an average age of 46.5 years in the upper abdominal group. The average age of the patients who died was 51.8 years. Only 22 females developed pulmonary complications after operation, against 119 males, although the death rate was considerably higher in the females than in the males, 45 per cent (10 cases) against 22.6 per cent (27 cases). Among

the deaths, furthermore, 24 followed operations on the stomach, and 11 on the gallbladder; the other 2 followed a hernioplasty and an intestinal operation respectively. These findings are in accord with the findings of other observers. There seems no doubt that pulmonary complications are peculiarly likely to develop in individuals advanced in years, in males rather than females, and after operations on the stomach.

A discussion of prophylaxis in this series would be useless, partly because there was no systematic attempt at it, partly because the method cannot be properly evaluated without a control series in which prophylaxis was not practised. King, who has studied the subject very thoroughly, and who has studied prophylaxis under the proper conditions, says that at the present time there is no completely satisfactory solution of the cause and prevention of pulmonary complications. He may have no solution, but his conclusions are eminently sane and practical. "In my own case," he says . . . "if I were to be the unfortunate male, with a perforated gastric ulcer, I should hope that the perforation would occur at a time when neither I nor my attendants had a respiratory infection. I should hope that the surgeon would be both rapid and gentle. I should not worry too much about the type of anesthesia, and my statistical mind, at least, would not be disturbed if I saw an ether cone. Whatever type of anesthesia is selected, however, I hope that the surgeon will pick the best anesthetist available and that he will do his work with all possible skill. Following the operation, I shall be content without carbon dioxide, and I shall be perfectly willing to have the surgeon put his faith in the best of postoperative nursing, including frequent postural change." That is the well considered opinion of a man who knows the subject as well as any of us, much better than most of us, and as matters stand now, there seems little or nothing to add to his conclusions.

BIBLIOGRAPHY

Eliason, E. L., and McLaughlin, Charles: Postoperative pulmonary complications, Surg. Gynec. Obst., 45:716, 1932.

Hawk, G. W. and Klotz, N. C.: Postoperative pulmonary complications, Guthrie Clinic Bull. v. 2, 1933.

King, Donald: Postoperative pulmonary complications: I. A statistical study based on two years' personal observations, Surg. Gynec. Obst., 46:43, 1933.

King, Donald: Postoperative pulmonary complications. The part played by the anesthesia, as shown by a two-years' study at the Massachusetts General Hospital, Anest. and Analgesia, 12:243, 1933.

King, Donald: Postoperative pulmonary complications: II. Carbon dioxide as a preventive in a controlled series, J. A. M. A., 100:21, 1933.

Lee, Walter E.: Postoperative pulmonary complications, Ann. Surg., 80:506, 1924.

Muller, G. P., Overholt, R. H. and Pendergrass, E. P.: Postoperative pulmonary hypoventilation, Arch. Surg., 19:1322, 1929.

Overholt, R. H., and Veal, J. R.: The incidence, character and significance of abnormal physical signs in the chest occurring after major surgical operations, New England J. Med., 208:242, 1933.

Robertson, H. E.: Pulmonary embolism following surgical operation, Am. J. Surg., 26:15, 1934.

Sise, L. F., Mason, R. L. and Bogan, L. K.: Prophylaxis of postoperative pneumonia: Preliminary report of some experiments after upper abdominal operations, Anest. and Analgesia, 7:187, 1928.

Snyder, H. E.: Postoperative pulmonary atelectasis, Ann. Surg., 102:5, 1935.

Wharton, L. R.: Postoperative pulmonary embolism, Internat. Clinics, 1:199, 1935.

DISCUSSION

Dr. Edgar Hull (New Orleans): This subject, which Dr. Veal has discussed so adequately, is an important one, since all too frequently pulmonary complications nullify the benefits that should accrue from carefully performed abdominal surgery. My knowledge on the subject is limited, being considerably less than that of the essayist, and I can see no reason for reiterating the practical suggestions Dr. Veal has made nor the logical conclusions he has reached.

In my opinion the factors which lead to postoperative bronchitis and pneumonia on the one hand, and atelectasis on the other, are much the same, namely, stagnation of secretions in the bronchi and lungs and alteration of their consistency and amount. If infectious organisms are present in the respiratory tree in considerable numbers, it would seem that these factors operating in relatively minor degree might lead to the development of bronchitis or pneumonia, while in the absence of these organisms nothing untoward would happen unless stagnation were more marked, in which case atelectasis, resulting from bronchial occlusion, would occur.

The causes of this stagnation undoubtedly lie in a failure of the normal mechanisms whereby the bronchial tree is cleared of the secretions of its glands, and whereby the character and amount of this fluid is so regulated that it is capable of removal.

Fluid is removed from the bronchial tree in health and in disease by three means: First, the movement of the cilia of the bronchial mucous membrane; second, cough; and third, postural drainage. The direction of the bronchi is such that the posterior and inferior portions of the bronchial tree get little or no postural drainage. Ordinary respiratory movements apparently play a minor part in cleansing the respiratory tree.

The amount and consistency of the bronchial secretion is regulated by the effect of parasympathetic and sympathetic nerve fibers upon the bronchial glands, the former presumably stimulating the glands to produce a thin serous secretion, the latter, a viscid mucous substance.

Following operations two of these mechanisms for cleansing the bronchial tree may be largely inhibited—cough, because of the pain it causes and because of the effect of large doses of sedatives; and postural drainage, because the patient lies quietly on his back most of the time. If, because of chronic bronchial disease, the ciliary function is largely lost, the third mechanism is inoperative. Thus we see that after any major operation, particularly in persons with long standing bronchial affections, conditions which lead to stagnation in the respiratory tree are present.

These conditions alone, however, are not responsible for any considerable number of postoperative pulmonary complications, since they are present after many other surgical procedures other than laparotomy. The elevation of the diaphragm and immobilization of the lower part of the chest, which is undoubtedly due to a viscero-somatic reflex arising from irritation of sensory fibers of the phrenic and lower intercostal nerves, may be concerned, but I am inclined to minimize the importance of these events because of the apparently insignificant role respiratory movements play in the removal of secretions from the bronchi.

The principal precipitating factor, therefore, would seem to be alteration in the secretion of the bronchial glands, either in its amount or viscidity. Such alterations are known to occur following laparotomy but apparently not following other operations. The cause of this phenomenon is undoubtedly a viscero-visceral reflex, but its pathways are not definitely known. Pottenger is inclined to believe that both pathways of this reflex are in the vagus, and that the effect of the reflex is to produce constriction and shortening of the bronchi and increase of secretion. It might well be, however, that its afferent pathway is over the phrenic and its efferent over the sympathetic, the result being the secretion of a very viscid secretion, difficult to remove, by the bronchial glands.

These theoretic considerations as to the cause of postoperative pulmonary complications would tend to emphasize the following measures as being important in their prevention and treatment:

1. Minimal trauma by the operator.
2. Frequent change of position after the operation, the patient lying on his left side a great deal. Elevation of the foot of the bed an hour or two each day.
3. Morphine in minimal doses to assure reasonable comfort for the patient.
4. Perhaps the avoidance of atropine postoperatively; although this may "dry" the secretions, it may also render them more viscid.

Purely on theoretic grounds, and without any practical experience to substantiate it, my opinion is that these measures would probably prove more valuable than deliberate deep breathing on the part of the patient, or the hyperventilation induced by carbon dioxide inhalation.

Dr. I. I. Lemann (New Orleans): I do not think this very thoughtful paper should go without further discussion, particularly by the medical man who is so often called upon to debate with the surgeon the situation after an operation. In former days, the internist was called to see a patient some days after operation. The patient had fever, cough, and signs of consolidation in his lungs. The verdict was naturally pneumonia. As Dr. Veal has pointed out, that is by no means certainly the case, probably less often the case. We are stopping to think more than twice in formulating the diagnosis of pneumonia. We rather think something else is happening than pneumonia because of the phenomena presented to us. It is not that we have now at our disposal methods that are going to lead to a prompter cure, prompter relief than before, but it is the fact that we are recognizing the real condition. That is important because we are now realizing what is going on and may look in the future to perhaps better methods of prevention, and perhaps even better methods of treatment than are at our command now.

It is because of this reflection that I have ventured to repeat and reinforce what Dr. Veal and Dr. Hull had to say, not that I added anything new to the paper, but because I think it is extremely necessary that all of us, surgeons and medical men, realize the importance.

Dr. Urban Maes (New Orleans): Formerly inhalation anesthesia was blamed for all postoperative pulmonary complications, but as Dr. Veal has shown in this study, they are just as frequent after other types. It is now very generally agreed that the old idea is wrong and that other factors unrelated to the variety of anesthesia determine the incidence of postoperative pulmonary complications.

The preponderance of males over females in the matter of postoperative pulmonary complications is striking. For my own part, I believe the ex-

planation is two-fold, more advanced age, plus the fact that most of these patients were smokers and probably had a bronchitis to start with.

Certain mechanical factors are also important. For one thing, we are not careful enough about postoperative dressings. The habit of plastering adhesive all over the upper part of the abdomen, which is a very general habit among internes, is bound to restrict the respiratory excursion of the chest and predispose to various pulmonary complications. In the second place, we have gotten away entirely from the transverse incision. The longitudinal incision narrows the lower part of the chest and reduces the respiratory capacity, whereas the transverse incision either does not affect it at all or actually increases it. In the third place, we are not sufficiently careful to move our patients around in bed or to see that they move. Movement is the best method I know of preventing pulmonary complications, and it is particularly important in these days when preoperative medication involves the use of drugs that keep the patients asleep for a long time afterward. As soon as the patient is able, he should be instructed to do his own moving. I believe it was Dr. Gamble of Mississippi who devised a sort of bicycle arrangement to be attached to the foot of the bed; the patients pedaled vigorously, and the incidence of postoperative complications was lessened.

Finally, I should like to call attention to the fact that the habit of attributing all sudden postoperative deaths to pulmonary embolism ought to be done away with. Actually, embolism is really infrequent. At my suggestion Dr. Ralph Lampert has just studied a series of 309 autopsies from Charity Hospital, with the idea of determining the incidence of postoperative embolism, and his figures are rather interesting. Embolism was the cause of death in 3 cases and was diagnosed as the cause of death in 5 cases. The significant thing, however, is that the cases did not overlap. Embolism was not the cause of death in any case in which it was diagnosed clinically and was not diagnosed clinically in any case in which postmortem examination proved it to exist. My own idea is that other studies like Dr. Lampert's would probably show the same state of affairs.

Dr. James D. Rives (New Orleans): I want to emphasize one possible source of postoperative complications, aspiration of infected material from the mouth, nose, and pharynx, and to recount my own experience of the past year.

About a year ago, having a case of gastric obstruction of some duration, I had a tube put in the stomach through the nose three days before operation and by continued irrigation and aspiration of that stomach got it quite clean. I left the tube in during operation. I was so pleased because the stomach was so clean that I made this plan my routine practice. The number of cases is not very large, but I am quite sure that 30 per cent of these patients have had pulmonary complications, three of them serious, two of them fatal, and I am now disposed to believe that the retention of the tube for a long time in the nose and pharynx set up an irritation, or lighted up an irritation already present, and contributed to the infectious complications in the lungs.

Dr. J. Ross Veal (Closing): In reply to Dr. Maes' question about the number of vascular complications in this particular series, I would say that we noted four deaths from infarction. Of these two were diagnosed at autopsy, and one by roentgen ray. The fourth case, in which death was considered due to pulmonary embolism, was not autopsied.

We were particularly interested in our study of these records to determine the frequency of postoperative pulmonary complications in this mild climate as compared with their incidence in colder climates. We found the incidence almost the same, though the incidence during the warmer months of summer was decidedly less frequent than during the colder months of winter.

It should be stressed, in conclusion, that complications which follow upper abdominal operations are far more serious than those which follow lower abdominal operations and carry a higher mortality rafe.

TREATMENT OF CHRONIC VARICOSE ULCERS OF THE LOWER EXTREMITIES*

NEAL OWENS, M. D.†

NEW ORLEANS

Varicose ulcers of the lower extremity, are cutaneous defects associated with varicose veins. They vary in size from a few millimeters in diameter to areas which completely encircle the leg and occasionally attain a width of 4 to 5 inches. These ulcers are usually shallow with sloping edges and the appearance of their bases is dependent upon the degree of chronicity, the amount and type of infection, the type of varicosities, the associated edema, fibrosis, and the underlying tissue changes which are present. Edema is usually present. Frequently there is also an excessive dryness of the skin surround-

*Read before Orleans Parish Medical Society, July 13, 1936.

†From the Department of Surgery and Hutchinson Memorial Clinic of Tulane University School of Medicine, and Charity Hospital, New Orleans, La.

ing the ulcer which is caused by an eczema and associated with a widespread pigmentation.

Varicose ulcers are more common than any other type of ulceration of the lower extremity. Thomas[1] has estimated that about 90 per cent of chronic leg ulcers are of the varicose type. This percentage varies with geographical location and is probably lower in those areas where the incidence of syphilis is high.

Varicose ulcers are more frequently found on the left leg than the right and the most frequent site is above the internal malleolus. Goodman[2], in an analysis of 64 cases of chronic ulceration of the lower extremity, found 26 patients with chronic ulceration of the left leg, 25 patients with the right leg involved, and 13 patients with both legs involved. In patients with ulcers on the right leg the lesions were clinically of the luetic type. Thirteen patients of this latter group showed positive Wassermann reactions, two were anticomplementary, and in 10 the reaction was negative. In the 26 patients with ulcers on the left leg, it was not possible to make clinical diagnosis of syphilis. Nineteen patients had negative Wassermann reactions, one an anticomplementary, and two slightly positive reactions. In the group with ulcers on both legs, a clinical diagnosis of syphilis could not be made. An analysis of this small group of cases showed that chronic ulceration of the right leg was more likely to be syphilitic than a similar ulceration involving the left leg. Negative Wassermann reactions were found in 73 per cent of the cases with ulceration on the left leg, whereas only 40 per cent of the cases with chronic ulceration of the right leg had similar reactions.

The causes of varicose ulcers are the cutaneous and subcutaneous changes occurring because of improperly treated varicose veins. Steubner[3] considers standing posture and endocrine insufficiency as two important factors in the development of varicosities. DeTakats[4] states that the hereditary factor is important in about 65 per cent of all cases. In quoting Curtis[5], he states that many patients suffering from varicose veins have familial predisposition to varicosities. These frequently show varicosities of the septum, small cutaneous naevi, spider-like telangiectases, and vascular fragility to the point of developing ecchymoses from the slightest injury, and yet the patients have normal bleeding time, coagulation time, and platelet counts. Ochsner[6] contends that varicose ulcers are the result of venous stasis, with its resulting anoxemia, local acidosis, and stagnation of metabolic processes in the skin and subcutaneous tissue. An analysis of this stagnation resulting from chronic varicosities shows a tremendous concentration of metabolites; there is an increase in CO_2 content (3.9 per cent by volume) with a corresponding decrease in O_2 content (4.84 per cent by volume); a decided increase in N. P. N. content (two to three times that normally found), and a local acidosis with a decrease in arterial supply as determined by the histamine test. Trauma to the leg with the above changes usually furnishes the necessary tissue damage for the entrance of bacteria and, due to the diminished blood supply, stagnation, and low resistance of the part, infection with an associated lymphangitis and phlebitis develops. Chronic ulceration with its subsequent changes is the natural sequel. Mason[7] considers that there are two primary factors in the production of these ulcers: (1) improper drainage and (2) infection. He states that fluid escaping from the blood vessel can return only through the lymph channels. The deep lymph vessels of the leg are few in number, originate from the muscles, and follow the deep blood vessels. The superficial lymphatics lie below the integument and above the deep fascia. The deep fascia forms a tubular investment of the muscles and consequently separates the superficial from the deep lymphatics, so when there is an obstruction of one there are no collaterals because of this membrane. It naturally follows then in those cases with lymph obstruction that there will be permanent disability with subsequent edema. Because of the above mentioned factor, Ochsner[6] emphasizes the importance of avoiding injury of any nature, particularly injury from scratching to relieve the intense itching which results from the associated eczema that is frequently present.

The complications associated with varicose ulcers of the lower extremity are numerous. The following are some of the more common:

phlebitis, erysipelas, lymphangitis, periostitis, osteomyelitis, calcification of the deep blood vessels of the leg, fixation of foot in abnormal position, callous formation with subsequent formation of trophic ulcers, and, rarely, Marjolin's ulcer. Erysipelas is occasionally seen resulting from bacterial invasion following scratching for the relief of the itching caused by the eczema. Fixation of the foot in abnormal positions is a complication which usually manifests itself late in the stage of chronic ulceration and results from contracture by excessive scar. There may or may not be an associated ankylosis. Frequently the contracture is sufficient to draw the foot into a position where weight bearing areas are shifted over unusual bony prominences with the production of callouses and these at times undergo changes, resulting from continued pressure, which end in trophic ulcers. Phlebitis, lymphangitis, periostitis, osteomyelitis, and calcification of the deep vessels of the leg are complications which result from progression of the infection. These changes represent a progression of the original process that started as a bacterial invasion but which grew progressively worse. Norris[8] states that there are fundamental changes in remote structures which are frequently not recognized. The tibia and fibula are commonly so extensively involved that periostitis or osteomyelitis can extend throughout the entire shaft and even involve the epiphysis, but when present the infections are usually so attenuated that they pass unnoticed and occasion little or no pain. The inflammatory processes resulting in the most extreme structural changes never apparently reach the stage of abscess formation, and, if suppuration exists, its products are absorbed in the body. Widespread vascular changes are frequently found in the deep vessels (posterior tibial and the peroneal), showing marked calcification which sometimes extends to the popliteal above. These vascular changes are most marked when the ulcer has been present for a long time but they occur independently of site, size, or depth of the ulcer. Roentgen ray studies of the involved bones show no involvement immediately beneath the ulcer but frequently manifestations are found at the opposite end of the bone. The osseous changes found may not even be confined to the bone immediately underlying the ulcer but may occur to an equal extent along the bone on the opposite side of the leg. It is logical to assume that this process is not due to direct invasion of bacteria from the ulcer bed to the bone, but is in all probability more generalized. Advanced arteriosclerosis, as evidenced by calcified arteries demonstrated by roentgenologic studies, suggests that the logical method of bacterial distribution to the remote parts of bone is by way of the arterial wall and adjacent lymphatics. The logical mechanism would be that the lymphatics which drain the ulcer later become the seat of chronic lymphangitis, extending proximally not only through the superficial lymphatics to the femoral nodes but also through the deep lymphatics. Chronic lymphangitis of the perivascular lymphatics permits bacteria to migrate through the delicate lymphatic walls and to penetrate the walls of the arteries and veins, thus enabling the bacteria to penetrate the walls of the nutrient vessels to be distributed to all parts of the bone. As calcification is a late manifestation of chronic infection, the calcification of the vessel walls would be the logical result.

Chronic varicose ulcers of the lower extremity are probably more generally treated in an injudicious manner than any other common surgical condition. Poverty and indifference on the part of the patient and lack of interest on the part of the physician are factors which are largely responsible. Failure to apply fundamental principles in attempting to effect wound healing along with failure to consider associated pathological and physiological changes are factors which are frequently responsible for improper care. Probably 70 to 75 per cent of all varicose ulcers of the lower extremity, if treated timely and properly, can be cured by relatively simple methods, progressing from the prophylactic procedures of avoiding trauma, venous injections, and supporting bandages to the more active treatment of the ulcers, as physiologic rest, hot saline dressings, elevation of the part in bed, application of sea sponges, pressure, and Unna's paste boot. All the above procedures have been adequately described by Ochsner[6], McPheeters[9], Dixon

Wright[10] and others, and as this paper is concerned with the treatment of the more chronic varicose ulcers of the lower extremity, no attempt will be made to go into those procedures in detail.

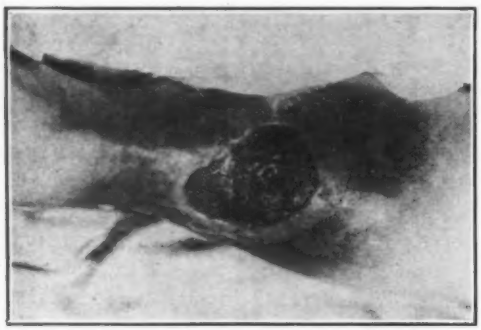


Fig. A-1. Photograph showing chronic varicose leg ulcer. This leg showed considerable venous stagnation and lymph edema. The amount of scar was small, thus enabling a cure to be effected by applying Davis grafts to the ulcer while the patient was still ambulatory.

Fig. 1-B. Photograph showing the ulcer healed after the application of the Davis grafts.

An examination of a chronic varicose ulcer of the lower extremity reveals a shallow ulcerated area with sloping edges and a dirty grayish base varying in size with the amount of infection and chronicity. There is always a discoloration of the skin with an eczema, dryness, scaliness, and brawny induration. The skin surrounding the ulcer is hard, infiltrated with scar, and cadaverish in appearance. On palpating the surrounding skin, venous lakes are outlined here and there as soft areas, varying in size and lying between firm ridges of scar which mark their boundaries. The skin surrounding the ulcer is hard and resistant and there is an obliteration of normal subcutaneous tissue. The skin may be firmly fixed and adherent to the underlying bone with a fixation of the foot and ankle in abnormal positions, the degree depending upon the amount of scar and the direction of the pull. There is always a varying amount of edema. DeTakats[4] has shown a decrease in arterial supply by means of the histamine test. Trout[11] and Mason[7] have called attention to the lymphatic obstruction with its resulting edema and have suggested methods for its correction. Probably too much importance has been attributed to the fact that there commonly occurs a chronic lymphangitis with a lymph stasis in chronic varicose ulcers. With all the accumulated data showing

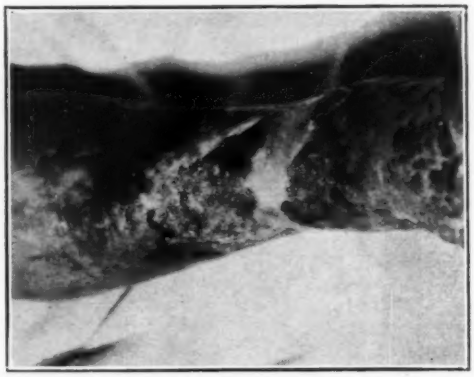


Fig. 2-A. Photograph of chronic varicose ulcer of the right leg which had been present for eighteen years. This patient experienced so much pain from this ulcer that she was unable to walk without support for twelve years.

Fig. 2-B. Photograph showing the ulcer after healing had been effected by means of Davis grafts. Following the repair of this ulcer the patient has been comfortable and is now carrying on normal household duties. Note the diminished amount of swelling after healing has taken place.

the marked pathologic and physiologic changes present in association with chronic leg ulcers one is impressed by the fact that methods are still used in the attempted treatment of this condition which a casual analysis would show to be futile. The lessened arterial supply to an involved area surrounding a chronic varicose ulcer has been proved by the histamine test and yet attempts to heal large chronic varicose ulcers by external stimulation still persist with no apparent thought of the consequences. It is true that many of these ulcers can be healed by long rest and application of heat and support, but the supreme test is more in the stability of the healed wound than in the mere healing. A large per cent of these wounds show a healing equilibrium which is well balanced. Many of them may be completely healed and made to remain healed under ideal conditions; others may be made to heal but will not remain healed unless properly supported by pressure, showing an immediate instability when any

Fig. 3-A and B. Photographs showing chronic varicose ulcers of the right leg with a tremendous amount of scar. The foot has been drawn into an everted position by means of scar contracture. This ulcer has been present for fourteen years. The ulcer has the appearance of having undergone malignant change and because of this I first did a biopsy to determine the presence or absence of Marjolin's ulcer. The biopsy report was negative, so that moist dressings were immediately applied in order to stimulate granulation and eliminate infection. Davis grafts were subsequently applied and healing was effected about twelve days after.

Fig. 3-C and D. Photographs showing the healed stage following application of Davis grafts. Note the diminished swelling following healing of these ulcers. This case responded so satisfactorily that no surrounding scar was excised. Since healing has occurred both ulcers have reappeared beneath the areas which were grafted, thus proving the fallacy of not excising the surrounding scar before grafting.

strain is encountered, and still others will epithelialize to a degree which greatly reduces the size of the ulcer and then for no apparent cause that portion which has already epithelialized will slowly begin to break down, melting like snow in the sun. Probably every ulcer which is greater than 3 inches in diameter should be repaired by scar extirpation, followed by skin grafting, if a permanent and satisfactory healing is to be obtained, for a large percentage of these ulcers, if healed by the less radical methods of heat application, obliteration of veins, sponge pressure, and Unna's paste boot, will subsequently become unstable under the slightest strain.

An incision through the skin surrounding one of these chronic varicose ulcers of the lower extremity probably reveals the explanation for most of the difficulties in effecting permanent and satisfactory healing. The skin is permeated with dense scar; not only surrounding the ulcer, but also extending beneath the base, is a layer of scar tissue varying from one-fourth to one-half of an inch in thickness. Upon observing this mass of scar one needs no imagination to realize the difficulty if not the impossibility of blood vessels penetrating its thickness. On the basis of the above findings we have used an operative procedure in the more advanced cases of chronic varicose ulcers of the leg in which advanced tissue changes have been present. As a preliminary therapy all varicose veins are obliterated by means of injecting some satisfactory sclerosing substance or by a combination of ligation and subsequent injection of sclerosing substances. Following the obliteration of the involved varicosities the operative procedure consists of complete excision of all scar surrounding the ulcer, with a wide lateral margin, and complete extirpation of all scar forming the floor of the ulcer, including the deep fascia. Complete extirpation of all scar requires dissection which is sufficiently radical to expose underlying muscles and tendons. The above described procedure not only fulfills all the requirements for obliterating varicose veins for relief of venous stagnation and the re-establishment of lymphatic communication between the superficial and the deep systems in overcoming lymph stasis, but also affords a vascular supply which springs from the tissues beneath the deep fascia to send capillaries upward which will be adequate to support skin grafts for the repair of the defect produced. Following the radical removal of scar no immediate repair is attempted at this stage. The patient is required to remain in bed and continuous hot wet hypertonic saline dressings are applied. The involved leg is constantly kept under a heat tent. After a period of forty-eight to seventy-two hours, a beginning proliferation of granulation tissue is clearly visible. This proliferation of granulation tissue steadily progresses for twelve to fourteen days when the defect resulting from the extirpation of scar, which formerly showed only exposed muscle and tendons, reveals a firm, healthy granulating surface completely covering the wound. The granulations at this stage are firm and velvety and show a healthy proliferation of capillary buds. They afford ample vascular supply for the viability of skin grafts, and it is important that grafts be applied at this time as no proliferation of scar has occurred. Procrastination beyond this stage only permits an increase in the formation of fibrous tissue which in turn lessens the proliferation of healthy granulation by contracture, naturally diminishing the available blood supply for the grafts. Davis grafts or those of the intermediate type are the grafts of choice in repairing these defects. Either graft will produce a satisfactory and stable type of repair enabling the patient to carry on his usual daily routine with little or no difficulty. Following the repair of the defects by means of skin grafting the patients must be careful in the treatment of the involved leg. Adequate circulation is not immediately established and for this reason the patient should gradually develop the circulation to the grafts by lowering the leg to a dependent position for only a few minutes at each trial, being careful to raise the leg to body level immediately when congestion and bluish discoloration are noted. A few of the above described exercises, slightly increasing the time element each day, will serve to develop the circulation sufficiently to enable the patient to keep the involved leg in a dependent position for twenty to thirty minutes

within one to two weeks. After reaching this stage it is usually safe to permit walking in moderation with the aid of a crutch. When walking, the patient's leg should always be supported by means of some satisfactory bandage, preferably one which is interwoven in a manner which imparts an elastic-like quality, for a period of six to nine months. After this period of time it is usually safe to discard the support entirely. Care should also be taken in preventing the graft from becoming hard and dry. This is done satisfactorily by applying cold cream and massage. Frequently itching is a

Fig. 4-A. Photograph of chronic varicose ulcer which had been present for forty-five years.

distressing symptom because of dryness in the graft. This is satisfactorily overcome by the application of a generous coating of castor oil, and this same remedy is equally efficacious for the relief of the intense itching resulting from the eczema which is associated with varicose veins and varicose ulcers.

By means of the above technic we have been able to treat successfully patients suffering from

Fig. 4-B. Shows extent of dissection which was done, revealing tendon and muscle.

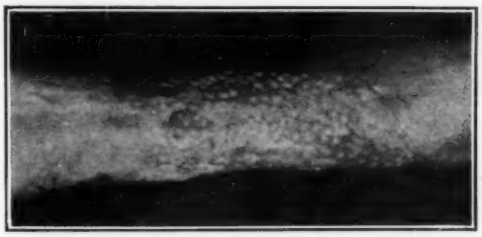


Fig. 4-C. Shows the result following application of Davis grafts after granulation had been stimulated by means of hypertonic saline soaks. Healing in this leg has remained entirely stable.

chronic ulcers of the lower extremity. Many of our patients so treated have suffered from these ulcers for exceptionally long periods (one for over thirty years) and showed many associated complications. One patient who had been unable to walk for over twelve years because of extreme pain is now restored to normal activity as a housewife. Following the repair of the ulcers by means of skin grafts the patients have been comfortable and able to resume a greater part of their normal activity. Those cases which had complete removal of the scar about the ulcer and dissection down to muscle and tendon have remained healed and have shown no tendency to become unstable; conversely, in the cases in which a compromise was made and less scar was removed, even though the veins had been thoroughly obliterated, it was found in nearly every instance that the ulcer did not remain healed. An interesting observation in those cases which were grafted and subsequently showed a tendency for the ulcer to recur is that the tissue which became unstable and melted away was always the surrounding scar and not the graft, thus giving further evidence that the instability seen in healed varicose ulcers was intimately associated with scar and inadequate circulation.

We feel that sufficient consideration is not given the care of chronic varicose ulcers, not only from the standpoint of the patient's welfare, but also from the standpoint of the enormous economic loss. A casual survey may cause some to assume that the cost of hospitalization over a period of six to eight weeks would not be justified, but when one balances this against years of time lost by the patient with associated suffering and cost of clinic

treatment (including supplies and clinic attendants), the hospitalization cost pales into insignificance in comparison. Dixon Wright[10] quotes one extreme case which, when estimated from point of time loss, cost of materials, medical costs, and pension payments, cost the British government 5,000 pounds over a period of forty years. The care of these cases constitutes a problem which must be handled with determination for many of the patients are indifferent to the point of being perfectly content to remain clinic patients, preferring to continue as clinic cases and receive regular tri-weekly dressings rather than submit to an operation. It is questionable whether clinics can economically afford to assume responsibility for supplying material, available clinic space, and time of clinic attendants over a period of years rather than insisting that these patients submit to cure by operation.

A large percentage of chronic varicose ulcers of the lower extremity can be entirely eliminated by proper care in the early stages of their development. This responsibility rests upon the shoulders of the profession in all cases seen in the early stages, for a majority of these ulcers can be prevented or held in check if judiciously treated at this time by the simpler methods. Those cases that develop ulcers which do not show stable healing can be healed by grafting while still ambulatory. It is possible to effect permanent healing in a high percentage of the early varicose ulcers, before the stage of massive scar formation, by the application of Davis grafts. These grafts can be held fixed by sea sponge pressure in a manner which permits the patient to remain ambulatory. Thus when it is possible to effect healing of the early ulcers by ambulatory methods, the responsibility of preventing chronic varicose ulcers rests squarely upon the profession.

REFERENCES

1. Thomas, B. A.: Treatment of leg ulcers by the gelatin-glycerine zinc oxide paste dressing, University of Pennsylvania Med. Bull., 23:365, 1910.

2. Goodman, Herman: Ulcer of the leg, Arch. Dermat. & Syph., 6:179, 1922.

3. Steubner, Roland W.: Varicose veins, their treatment by injection, Surg. Gyn., Obst., 51:169, 1930.

4. DeTakats, Geza Quint, Harold, and Tillotson, B. I.: Impairment of circulation in the varicose extremity. Arch. Surg., 18:671, 1929.

DeTakats, Geza, et al: Injection treatment of varicose veins, Surg. Gyn., Obst., 50:545, 1930.

5. Curtis: Quoted by DeTakats.

6. Ochsner, A. and Garside, Earl: Chronic leg ulcers, Texas St. J. Med., 25:587, 1930.

Ochsner, Alton: Chronic cutaneous ulceration of lower extremities, Med. & Surg. J., 84:594, 1932.

7. Mason, J. Tate: Lymphangioplasty in the treatment of some leg ulcers, Northwest Med., 7:320, 1915.

8. Norris, D. H.: The deeper structural changes arising from varicose ulceration, Surg., Gyn., Obst., 30:72, 1920.

9. McPheeters, H. O.: Ulcer cruris., Surg., Gyn., Obst., 47:469, 1928.

McPheeters, H. O.: Treatment of varicose ulcers, Surg., Gyn., Obst., 52:1164, 1931.

10. Wright, A. Dixon: Treatment of varicose ulcers, Brit. Med. J., 2:997, 1930.

11. Trout, Hugh H.: A new principle in the treatment of ulcers due to varicose veins and lymphatic blockage, Tr. South. Surg. Assoc., 41:57, 1928.

DISCUSSION

Dr. Howard Mahorner (New Orleans): Of all the cases of varicose veins treated in the Department of Surgery of the Hutchinson Memorial Clinic, 29 per cent have varicose ulcer. This does not include all the cases of varicose veins diagnosed as such in the Hutchinson Memorial Clinic, but only those treated in the Department of Surgery. By far the greater number of patients with varicose veins are seen in the Department of Obstetrics and because of the tendency to recover after parturition, most of these cases do not receive surgical treatment. The high incidence of varicose ulcer found in our patients indicates to some extent that varicose veins we are seeing are frequently severe or far advanced. Approximately one in every six cases of varicose ulcers treated by us have had skin grafts by Dr. Owens. Skin grafts will accomplish healing in some instances in which it cannot be accomplished by other methods and facilitates healing in other cases when the ulcer is large.

The size of the varicose veins does not bear any direct relationship to the incidence of varicose ulcer. Sometimes patients with huge, neglected varicose veins do not have ulcers, whereas others with varicosities apparently less marked have ulcers. Undoubtedly, however, ulcers are directly proportionate to the amount of local stasis.

This all brings up the matter of modern treatment of varicosities. Because of the high incidence of recurrence noted in those cases in which the injection treatment alone was used, we have turned with increasing satisfaction to actual section and ligation of the internal saphenous vein and simultaneous injection of the distal stem. Sometimes we ligate the vein high only; sometimes high and low, depending upon the result obtained from the test devised in this clinic, but too complicated to explain here, evaluating the competency of the valves of the veins communicating between superficial and deep system.

It was the high mortality varying from 0.7 per cent to 1.5 per cent that resulted in operations

which had as their object the entire elimination of the internal saphenous system, such operations as Madelung's, Mayo's, and Babcock's being thrown to the discard. Such a mortality would discredit any procedure for varicose veins. The procedure we are using is so far without any mortality in our experience or any recorded mortality. We ligate the patients in the clinic and after an hour let them walk out. We insist on their walking some every day and will not permit them to convalesce in bed. We believe this mitigates against clot propagating into the deep system with the possibility of resulting pulmonary embolism. Ligation and section and injection of the distal stem of the vein with sodium morrhuate or sodium gynocardate results in a thrombosis of the internal saphenous in the thigh, sometimes propagating down into the superficial veins of the calf. One treatment instead of many injections may be sufficient to cure the varicosities of an extremity. Should even an extremely small mortality result from this type of treatment, we will have to discourage its use, but so far in a large number of cases we have had no untoward results, and since 1929 when de Takats showed the feasibilty of ligation with the patient ambulatory through the entire convalescence, there has been no death reported from ligation when the patient remained ambulatory. The reduced incidence of recurrence and improved results by this method in our experience justifies its employment in the moderate and severe cases of varicose veins. In the mild types in which the Trendelenberg test is weakly positive we still rely on the injection treatment alone.

THE SIGNIFICANCE OF CARDIAC ARRHYTHMIAS AS ENCOUNTERED IN GENERAL PRACTICE

WILLARD R. WIRTH, M. D.†
NEW ORLEANS

The disturbances of normal cardiac sinus rhythm, that is, the variations from the normal cardiac mechanism when the sinus node serves as pacemaker, are all grouped under the inclusive term of cardiac arrhythmias. The term arrhythmia literally means "not measured motion," therefore irregular, and in the strictest sense of the term should be concerned only with irregularities of rhythm. But the term cardiac arrhythmias is now used to include all deviations from the usual normal sinus rhythm, whether they are regular or irregular in rhythm.

I shall attempt to present a discussion of these arrhythmias, including disturbances of the sino-auricular pacemaker mechanism. The discussion will consist of an explanation of the mechanism, the means of recognition, the significance and the treatment of each type. As to the means of recognition, or diagnosis, stress will be placed particularly upon clinical facts, and the electrocardiographic characteristics will be used only to explain the mechanism more clearly, and as a possible means of diagnosis and differentiation in those forms which cannot be diagnosed definitely, or at all, clinically.

After such a lengthy preamble, it must further be stated that I have nothing original to offer. These cardiac arrhythmias, since the advent of the electrocardiogram, are all clearly understood and have been very adequately described by many authors. Any discussion on the subject at this time can be only a summary of the existing information and opinion from reliable sources. These have all been drawn upon freely.

SINUS ARRHYTHMIA

Sinus arrhythmia is best described as a waxing and waning of the cardiac rate, constantly recurring, accompanying inspiration and expiration. During inspiration the rate increases, and during expiration the rate decreases. This then produces an alternate acceleration and slowing of cardiac rate as heard at the apex or felt at the radial pulse. Occasionally it may occur phasically without this relationship to respiration. It may be quite noticeable with quiet normal respiration; moderately well marked or not clearly connected with quiet respiration, but definitely demonstrated upon deep breathing; or noticeable only upon deep breathing or as a marked slowing of the rate while the breath is held in deep inhalation.

Sinus arrhythmia, or respiratory arrhythmia, occurs usually in children and young adults, and is, therefore, also called juvenile arrhythmia. It is found occasionally in older individuals, and rather commonly in the aged. It is almost always associated with a relatively slow rate, certainly under 100 per minute, and

†From the Departments of Medicine, Tulane University School of Medicine and Tulane Graduate School of Medicine.

when the rate is increased above 100 per minute the irregularity usually disappears.

This arrhythmia is entirely physiologic and has no clinical significance except the differentiation from other abnormal significant rhythms and the knowledge that it is non-pathologic. When it occurs in individuals past 25 years of age it is considered an indication of vagus-sympathetic imbalance, or increased vagal tone. In older individuals it may mean some pathologic changes in the auricles near the sinus node. This statement is not a certain one.

The fact that sinus arrhythmia does not of itself indicate cardiac disease does not mean that it cannot occur in individuals with myocardial damage. This same statement applies equally as well to other arrhythmias to be discussed which, while in themselves are not indicative of cardiac damage, may occur in individuals with such damage. In such cases, of course, the diagnosis of cardiac pathology must depend upon other factors than the arrhythmia. This fact concerning sinus arrhythmia must be emphasized because it has been my experience that many physicians will dismiss the possibility of myocardial damage in a given individual on the basis that a sinus arrhythmia is present and that such an arrhythmia cannot exist in a damaged heart. This is untrue. It may also be the result of full digitalization producing increased vagal tone.

In connection with these statements it is true that in certain disease conditions, such as hyperthyroidism or rheumatic heart disease, in which the cardiac rate has been rapid and regular, the appearance of a sinus arrhythmia is an indication that the underlying pathologic condition is clearing up, and normal vagal tone is gradually being re-established.

It is clear then that no treatment is necessary for sinus arrhythmia. These individuals should not be considered to have cardiac disease unless other signs are present, and their activities should not be limited.

PREMATURE CONTRACTIONS

Premature contractions are a type of cardiac irregularity which are also termed extrasystoles and ectopic beats. The names are synonomous, but the term premature beat more accurately describes the mechanism. They are contractions which occur prematurely, or earlier in the cardiac cycle than they should. In this manner an irregular rhythm is produced. A normal cardiac cycle is followed rapidly by a premature beat, followed by a pause longer than the interval between regular beats, and then a resumption of the normal rhythm until another premature contraction interrupts it when the disturbance is repeated.

Such an irregularity can be recognized at the bedside usually by a study of the cardiac and pulse rates, and the heart sounds. The pulse will usually show a beat occurring sooner than one would expect following the previous beat, a pause longer than the usual interval between beats, and then a resumption of the usual rhythm. The cardiac impulse will be similarly disturbed. The heart sounds will show two, or occasionally one, heart sounds occurring shortly after the previous two heart sounds associated with the early beat palpable at the wrist. A pause will then ensue and the heart sounds will again be heard in their usual rhythm. The fact that one sound or two sounds are always heard over the heart synchronous with the premature beat felt at the wrist is very important in its differentiation from at least one other arrhythmia. Occasionally this premature contraction occurs so soon after the previous normal cardiac systole, therefore early in diastole, that the amount of blood thrown out into the circulation is insufficient to produce an early beat at the wrist. In this case there will be only a pause at the pulse, but the premature sounds will be heard. If very early in diastole, the blood volume may be insufficient to open the aortic and pulmonic valves and only a first heart sound will be heard since the second sound is the result of the closure of these valves. Such a resulting condition produces fewer pulse beats at the wrist than there are heart sounds at the apex, and the condition is called pulse deficit. It is not pathognomonic of premature contractions, however, since it also occurs in auricular fibrillation. The same mechanism explains the fact that with premature contractions some of the beats are strong, some are weak, and these variations can often be noted also on the sphygmomanometer.

The pause which follows a premature contraction is called a compensatory pause. It is due to the fact that when the next normal impulse reaches the cardiac muscle it has not completely recovered from its abnormal contraction, is therefore refractory, and cannot respond. It must, therefore, wait until the next normal impulse reaches it. It is truly compensatory following ventricular prematures, not quite so following auricular prematures.

These premature contractions may arise in the auricles, the ventricles or the junctional tissues between these chambers, namely the auriculo-ventricular node and the bundle of His. They are, therefore, termed auricular, ventricular and junctional or nodal premature contractions. They may occur frequently or infrequently, regularly or irregularly, in the cardiac cycle. They may occur from several different foci within the same tissues or in any or all of the three tissues in any interval. For clinical purposes it is practically impossible to differentiate them as to their source and this fact has very little significance. The possible differentiation will be mentioned. They are localized exactly by the electrocardiogram.

Premature contractions do not of themselves indicate cardiac pathology. They are a very common type of arrhythmia and occur in healthy individuals as a neurogenic or purely functional disturbance. Ventricular premature contractions occur about ten times more frequently than auricular premature contractions. The auricular type is most apt to be found in people with heart disease. The junctional type may be grouped with the ventricular type as to significance. It must again be understood that this type of arrhythmia does occur with heart disease, but the diagnosis must be based upon other evidence. Their prognostic value is, therefore, negligible. When a patient is found to have premature contractions he should be examined very carefully for cardiac or other diseases, but if no other findings are present the irregularity should be dismissed. If there are other signs of cardiac damage, a prognosis should be based upon these signs and not upon the premature contractions.

Suggested possible causes for the occurrence of premature contractions include coffee, tobacco, overwork, constipation, flatulence and infection. Under other circumstances there is no apparent cause. Sometimes they will occur during the course of, or in the convalescence from, an infectious disease. Digitalis will produce ventricular premature contractions, producing a type of rhythm described as coupling or pulsus bigeminus which will be described later. Digitalis does not produce auricular premature contractions.

Auricular premature contractions seem to have some relationship to auricular paroxysmal tachycardia, auricular fibrillation and auricular flutter. In cases of mitral stenosis, auricular premature contractions sometimes occur some time before auricular fibrillation occurs. When this occurs one feels that auricular fibrillation will probably be not long delayed. Auricular premature contractions, therefore, are found more frequently in individuals with heart disease. As stated before, it is usually considered impossible to differentiate them from ventricular premature contractions without the aid of a graphic method like the electrocardiogram. Levine offers a method of differentiation based upon the fact that the pause after an auricular premature contraction is not truly compensatory, that is, twice the usual length of a cardiac cycle from the previous regular beat to the next regular beat. This means that the pause will be shorter. If the clinician "taps with his foot in rhythm with the regular beats, and continues the same pace when the extra-systole occurs the foot will come down synchronously with the following beat if it is an extraventricular systole. This will generally not be so if it is auricular." The sounds occurring with auricular premature beats also sound like the normal beats, while the sounds with premature ventricular beats have a peculiar clicking sound. Such points of differentiation may be helpful.

For the most part, therefore, premature contractions should be dismissed as of no importance. The patient may not be conscious of their presence. He probably should be told of their existence and non-importance in order to avoid any future misconception. There should be no restriction of activity unless there are other reasons requiring this. If there are no

symptoms, no medication is required. One should investigate the suggested factors and eliminate them if possible. During or following an infectious disease their occurrence should cause one to prolong the convalescence. Some patients, however, do have symptoms which may be annoying. These are varied in type and include palpitation, short sharp pains, and sensations described as "heart skip" or "heart turns over." Under such circumstances possible causative factors should be eliminated. A source of infection should be sought and removed if possible. Failing here, drugs may be used. Sedatives such as bromides are helpful. Occasionally potassium phosphate, 30 grains (2 gm.) three times daily by mouth, is helpful. As a final resort, quinidine, 3-4 grains (0.2-25 gm.) three times daily, may abolish them, or, if taken before their usual occurrence, may prevent them. Such drugs as the latter two should be used only if absolutely necessary. Strychnine, 1/60 grain (0.001 gm.) three times daily has also been recommended.

While premature contractions occur usually with relatively slow rates and disappear or diminish in frequency as the rate is increased, there is a type which appears on physical effort. These are thought to be more serious, and may predispose to the development of ventricular tachycardia on effort.

Nodal premature contractions cannot be differentiated from the other two types clinically, and have no added significance.

PAROXYSMAL TACHYCARDIA

Paroxysmal tachycardia is a disturbance of cardiac mechanism resulting in a regular rapid rate beginning and ending abruptly. It lasts for a varying period of time and is often repeated at intervals. Frequently it offers nothing characteristic to distinguish it from any other rapid heart rate, or sinus tachycardia, and the distinction is often based on the history alone. The history of a sudden increase of cardiac rate ending as abruptly as it began is the significant feature. In contra-distinction to sinus tachycardia, the rate is fixed at this rapid level, and deep breathing, exercise or change of position has no effect upon it. The attacks usually occur without any apparent cause. The condition should always be suspected in a resting patient with a persistent fixed rate of 130 per minute or over, unexplained by the usual causes of tachycardia such as fever or hyperthyroidism. The rate may be as rapid as 160 to 200 or more per minute. Often, when the attack lasts for several hours, there are the typical signs of cardiac failure. When the patient is seen in the first attack it may be difficult to distinguish it from other rapid rhythms.

The mechanism of this arrhythmia is that it consists of a series of rapidly recurring premature contractions arising from the same focus. Paroxysmal tachycardia may, therefore, be auricular, nodal or ventricular in origin. It is usually stated that these types cannot be differentiated clinically the one from the other as to origin, and this is usually true. It is possible sometimes, however, to differentiate auricular or nodal paroxysmal tachycardia from ventricular tachycardia. This is then a differentiation between supra-ventricular and ventricular origin, and often the electrocardiogram can differentiate no further. The differentiation betwen these two broad types is important, and if it cannot be made clinically the electrocardiographic differentiation, if available, is quite helpful for reasons to be stated later.

Paroxysmal auricular tachycardia is rather common clinically and usually causes considerable discomfort. Rarely it may have serious consequences. The symptoms and possibility of the development of circulatory failure depend upon three factors: The duration of the attack which may be hours, days, or rarely weeks; the rate of the heart during the attack; and the state of the heart before the attack. The auricular type of paroxysmal tachycardia is about twenty-five times as frequent as the ventricular type, and is the least important. It usually occurs in individuals without structural cardiac defects, though it may be a complication of organic heart disease when it may assume alarming proportions. It ordinarily occurs without detectable cause, but may seem to be precipitated by unusual exertion, emotion, accumulation of gas, indigestion, or the intake of a particular food. When such precipitating causes are apparent, therapy directed to the gastrointestinal tract has apparently no benefit

in the prevention. Sudden changes of position may also be responsible for the onset.

The patient usually complains of palpitation and fluttering. He becomes nervous, apprehensive and occasionally has fairly typical anginal pains radiating to the arms. Nausea and vomiting may occur, terminating the attack often, and the supposition that indigestion is the responsible factor is strengthened. The patient quickly recovers with the restoration of normal rhythm, though he may be quite weak. With the other factors unfavorable and the persistence of the rapid rate, congestive failure may appear.

The clinical recognition of either the auricular or supra-ventricular and the ventricular type of paroxysmal tachycardia is essentially the same. Their differentiation may occasionally be possible clinically without graphic methods. Under all circumstances the recognition of the paroxysmal tachycardia is based upon the following: There is usually a history or definite evidence of an abrupt change of cardiac rate. The rate is regular and rapid, from 150 to 250 per minute. It may occasionally be slower. The rate remains fixed for long intervals and is uninfluenced by breathing or exercise. Levine states that rates as rapid as 250 per minute can be counted, if one is careful, by auscultation over the precordium. If one counts the heart sounds for 60 seconds by auscultation over the precordium and then repeats this count in a few minutes after slight exercise, or with the patient in a different position, there will be no more than two beats difference in the two counts in paroxysmal tachycardia. If there is a greater discrepancy than two beats one is probably not dealing with a paroxysmal tachycardia but a rapid sinus tachycardia. The count can be facilitated by tapping on a table with a pencil synchronously with the heart beats and counting the taps.

Given a paroxysmal tachycardia, the auricular type may be differentiated from the ventricular type by the fact that, while the auricular paroxysmal tachycardia is absolutely regular, the ventricular paroxysmal tachycardia will usually show slight irregularities. Slight variations may also be heard in the quality and intensity of the first heart sound with ventricular paroxysmal tachycardia; and the ventricular type is never influenced by methods of stimulating the vagus, often effective in the control of the auricular type. When they cannot be differentiated clinically and an electrocardiogram is not available, they should probably be considered as auricular and treated as such. If these measures fail, those recommended for the ventricular type may then be attempted.

No other rapid rate except paroxysmal auricular tachycardia will respond by a return to normal by simple means so quickly. With a normal tachycardia the return to a slow rate is gradual. Vagal stimulation by pressure over the carotid sinus or eyeball will cause a temporary slowing of a sinus tachycardia with a gradual return to the previously rapid rate. With paroxysmal tachycardia such vagus stimulation will cause the rate to fall abruptly to normal, or will leave it entirely unaffected. With auricular flutter temporary slowing only will result usually. With ventricular tachycardia the vagus stimulation will have no effect.

The treatment of auricular paroxysmal tachycardia is directed to ending the attack and preventing a recurrence. Many attacks will end spontaneously with no resulting harm if left alone. About fifty per cent will be stopped by vagal stimulation. One of the simplest methods is to have the patient hold a deep inspiration as long as possible or produce a quick expiratory effort with the glottis closed after a deep inspiration. The induction of vomiting by stimulating the pharynx or the use of syrup of ipecac, one to four teaspoonsful, is often effective. Lowering the head or lying down may end the attack. Carotid sinus pressure to produce vagal stimulation is most valuable. Standing behind the patient, pressure is made with the fingers on the right carotid artery just below the jaw. Pressure should be carried backward and medially against the spine for several seconds. The other side may also be pressed upon, but not both sides simultaneously. The next best method of vagal stimulation is by means of pressure over one eyeball at a time, pressing the eyeball firmly backward. If these measures fail, drugs may be used. Often acetyl-beta-methylcholine, 20 to 50 mg. (1/3 to 2/3 grain) given subcutaneously stops the at-

tack. Occasionally digitalis may gradually stop the paroxysm. Quinidine may be used in critical cases giving 5 grains (0.3 gm.) intravenously. This is a dangerous procedure, however. The prevention is difficult and only worthwhile if the attacks are frequent. Then either constant full digitalization or 3-5 grains (0.2 to 0.3 gm.) of quinidine sulphate by mouth daily may be successful.

Paroxysmal ventricular tachycardia is usually present with organic heart disease and is usually serious. It is not far removed in mechanism from the grave ventricular fibrillation. The rate is usually slower than the auricular type, between 160-180 per minute.

In the treatment of ventricular paroxysmal tachycardia quinidine is practically a specific. Five grains (0.3 gm.) of quinidine sulphate may be given by mouth every hour until the arrhythmia stops, but not more than nine doses should be given in 24 hours. Larger doses are sometimes given, as much as 22 grains (1.5 gm.) five times daily. Digitalis is not only of no value in this condition, but it may actually be harmful.

HEART BLOCK

By the term heart block is meant varying degrees of delayed conduction of the impulses from the auricles to the ventricles through the A-V node and the bundle of His. Such interference to the conduction of the impulse is, therefore, auriculo-ventricular or A-V block. This interference may be partial so that the impulses reach the ventricles but only after a longer than normal period, or some of the impulses are conducted while others are not, or complete auriculo-ventricular block when none of the impulses are conducted through to the ventricles.

There are, therefore, two types of partial heart block, or two degrees of conduction interference. The first, or lesser degree, is manifested merely by a prolongation of the conduction time from auricles to ventricles beyond the usual maximum normal. The maximum A-V conduction time is 0.20 second and any prolongation of the interval is abnormal. Instead of partial block this should be most correctly termed delayed auriculo-ventricular conduction. It can be identified only by the electrocardiogram, though it may be thought of as a possibility in certain conditions when a gallop rhythm is present.

The second degree, or true partial block, is produced when conduction is impaired to such an extent that an occasional impulse from the auricles is completely blocked and there is, therefore, no ventricular response to that impulse. Such a degree of partial block can be recognized clinically. The failure of the ventricles to contract at occasional intervals will produce a pause at the radial pulse and a pause in the sounds and impulses at the heart. There will be no beat at the pulse and no sound or impulse at the apex. This is, therefore, truly a "dropped beat." It should be clearly understood that the pause at the wrist is synchronous with the pause in sounds at the apex, differentiating it from that type of premature beat described previously which, while it may produce no premature beat at the wrist and only a pause will result, is always associated with an audible premature sound at the heart.

These pauses or "dropped" beats may occur at irregular intervals, but usually they occur at regular intervals to establish a definite rhythm. There will be a definite ratio between the number of auricular and ventricular beats so that every second, third, or fourth beat is blocked, and a pause results. This gives rise to a 2:1, 3:1, 4:1 block, expressing the ratio as the number of regular beats to the number of pauses or dropped beats, or a 2:1, 3:2, 4:3 block when the ratio is expressed as the number of auricular contractions to ventricular contractions.

These lower grades of heart block occur during rheumatic fever, diphtheria and infectious diseases to a lesser extent, as a result of chronic organic heart disease, or due to the toxic effect of digitalis or other toxic factors. Digitalis is the most common cause of the lesser degrees of block. The higher degrees of block are usually produced by degenerative heart disease. During the course of the infectious diseases the development of a heart block adds to the seriousness of the prognosis.

In young individuals not acutely ill with rheumatic heart disease, delayed A-V conduction or partial heart block is compatible with good health and full activity for many years. In older individuals it may be more serious, unless

due to digitalis, because so frequently it is then a manifestation of impaired coronary circulation. The development of delayed A-V conduction is the first electrocardiographic evidence of a rheumatic myocarditis, and is positive.

There is no particular treatment for these two degrees of heart block. Occurring during rheumatic fever, or an infectious disease, they signalize the desirability of a longer period of convalescence than usual. The prognosis is usually favorable. The higher degrees are grave when they develop during diphtheria. When caused by digitalis therapy, the drug should immediately be decreased in amount or discontinued. Occurring during the course of congestive heart disease they are no contraindication to the use of digitalis, but the drug should be used carefully to avoid increasing the abnormality.

When the auriculo-ventricular conduction system is blocked to such an extent that none of the impulses reach the ventricle then the third degree of heart block occurs, complete heart block. In this abnormal mechanism all the impulses from the auricles to the ventricles are blocked. The ventricles must, therefore, institute a rhythm of their own or there will be complete ventricular asystole, or standstill, and, of course, death. When the ventricles originate this rhythm, at any point or focus below the complete block, a so-called idio-ventricular rhythm is established. The rate is slow and regular, usually 35 per minute or less. The rate may, however, be as much as 50 per minute. This slow regular rate is usually uninfluenced, or influenced to a very slight extent, by exercise, atropine, amyl nitrite or anything that would ordinarily increase the heart rate. These facts enable one usually to diagnose complete heart block, or at least suspect it. When one is able to notice variations in the character of the heart sounds occurring independently of respiration the diagnosis is absolute with such a slow rhythm. Rarely one may be able to note numerous regular waves in the neck veins occurring at an entirely different rhythm from the pulse beats. These are produced by the independent auricular rhythm.

Complete heart block is always indicative of organic heart disease unless it is due to marked digitalis intoxication. It is more common in elderly individuals as a result of degenerative arteriosclerotic lesions. It is seen in young people, however, when it may be the result of some congenital anomaly of the conducting system, or a lesion as the result of some childhood disease, especially diphtheria or rheumatic fever.

The presence of complete heart block may not necessarily incapacitate the individual. In elderly patients cardiac efficiency is more likely to be impaired because of the fact that the abnormal rhythm is but a manifestation of generalized cardiac pathology. The slow regular rhythm may be sufficient to maintain adequate circulation under most circumstances, but there can be no response by a quickened rate to an increased demand occasioned by exercise, exertion, or infection. Under these circumstances embarrassment may occur. In young individuals there is often practically no limitation of activity.

The chief danger with complete heart block is the tendency to syncopal attacks or ventricular asystole. The syncopal attacks, known as Adams-Stokes syndrome, are produced by further slowing of the ventricles or complete ventricular standstill. Such attacks occur suddenly and the symptoms which they produce will depend upon the duration of the pauses. There may be only a slight dizzy sensation as a result of a pause of only a few seconds. Or the patient may faint for several seconds. If the pause continues for 20 to 60 seconds, the patient will become unconscious and have a convulsion. If it lasts a few minutes, death ensues. Occasionally ventricular systole may be resumed even after the heart has ceased beating for several minutes. These syncopal attacks may occur with the sudden onset of the complete block; at a period of transition between partial and complete block, with a ventricular rate of less than 20 per minute; or during an established complete block when the ventricular rate becomes very slow.

Therapy in complete heart block is, therefore, directed towards the attempt to prevent syncopal attacks and the treatment of these attacks. Adrenalin is the drug of choice for the attacks, 0.5 to 1 c.c. of a 1 to 1000 solution given in-

tramuscularly, or injected directly in the heart for a long attack of syncope. Between attacks, ephedrin in doses of 3/8 grain (0.024 gm.) once or twice a day may be used in an attempt to decrease the frequency and duration of the syncopal attacks. With very frequent attacks it may be necessary to repeat the injections of adrenalin every two or three hours for a day or more. Levine also recommends barium chloride, 1/2 to 1 grain (0.03-0.065 gm.) three or four times a day by mouth to inhibit attacks. This drug may be continued over a long period of time. Quinidine is absolutely contraindicated in these disturbances of conduction because of its depressing effect upon conduction and ventricular irritability. When cardiac failure ensues, digitalis may be used cautiously. However, the presence of complete block in such patients greatly limits the expected benefits from digitalis.

PULSUS BIGEMINUS—PULSUS TRIGEMINUS

It will be well to mention here two types of irregularities of the pulse which may be due either to premature contractions or partial heart block. These are pulsus bigeminus and pulsus trigeminus. In pulsus bigeminus the pulse beats occur in pairs and in pulsus trigeminus in trios. Pulsus bigeminus may be due to alternating premature contractions, the usual mechanism of digitalis bigeminus or coupling as a result of digitalis intoxication, the premature beats being ventricular in origin. Again it may be due to the third regular beat being "dropped" as a result of a regular partial heart block; or by still a third mechanism when the third beat is a premature contraction not producing a pulse wave at the wrist. With pulsus trigeminus each third beat may be a premature, each fourth beat a dropped beat, or each fourth beat a premature not felt at the wrist.

AURICULAR FLUTTER

In auricular flutter the auricles are contracting at a very rapid regular rate, usually about 300 per minute. Such a rhythm in the auricles is produced by a so-called pure circus mechanism in the auricular tissue about the great vessels. The ventricular rate will also usually be perfectly regular, and its rate will depend upon the ability of the conducting tissue to transmit these impulses. There will usually exist either 2:1, 3:1 or 4:1 block, though rarely there may exist a 1:1 conduction. This block is not a true block but is due to the refractory periods of the conducting system and the ventricular muscle.

It can readily be seen how difficult the clinical diagnosis of auricular flutter becomes. Such a rapid regular heart rate, when the block is of a lesser degree, may be due to a normal tachycardia, auricular paroxysmal tachycardia, or auricular flutter. The effect of vagal stimulation may enable one to differentiate it. If vagal stimulation slows it, the condition may be either auricular flutter or normal tachycardia. Rates of 190 or more at the apex cannot be normal tachycardia, because such a rate is too rapid. Since the auricular rate is rarely faster than 300 per minute with auricular flutter, the ventricular rate considered in its ratio to this rate is helpful. But with greater degrees of block, resulting in rates of 75 (4:1) or 100 (3:1) per minute the diagnosis is almost impossible. If one is fortunate enough to be able to see the regular rapid waves in the jugular veins produced by the auricular contractions, or, by having the patient exercise slightly, cause the block to decrease and the ventricular rate suddenly double for a short time, then one can make the clinical diagnosis. Ordinarily auricular flutter is considered impossible of exact clinical diagnosis without the electrocardiogram.

Auricular flutter may be associated with any type of organic cardiac disease or be entirely functional. It is usually considered a significant pathologic finding. It is apt to occur with hyperthyroidism, rheumatic fever, pneumonia, other infections, coronary thrombosis, and as a terminal event with chronic nephritis.

The drug of choice in the treatment of auricular flutter is digitalis. It may either restore normal rhythm or keep the ventricular rate slow. When the mechanism is restored to normal the ventricular rate slows, then auricular fibrillation occurs, and if the digitalis is stopped at this point a normal rhythm may follow. The digitalis is given in 5 grain (0.3 gm.) doses every six hours for two, three or four doses, then 1 1/2 grains (0.10 gm.) three times a day until digitalized, then a maintenance daily dose

of 1 1/2 grains (0.10 gm.) If auricular fibrillation results and continues when digitalis is stopped, it is a preferable rhythm to that of flutter when the rate is kept slow with a maintenance dose of digitalis. Following digitalization, quinidine may be used to attempt to restore a normal rhythm. Such a procedure is best carried out when frequent electrocardiograms can check the results.

AURICULAR FIBRILLATION

Auricular fibrillation is probably the most important arrhythmia, both from a diagnostic and a therapeutic standpoint. It occurs particularly in cases of mitral stenosis and in cases of hyperthyroidism. It may also occur as a part of the degenerative changes in arteriosclerotic heart disease. It frequently initiates the onset of cardiac failure, though it may occur, especially in the slow type, for long periods of time without causing any apparent circulatory embarrassment. It is always an indication of cardiac disease.

It is produced by an impure circus movement similar to that of auricular flutter, except that the auricles do not contract regularly and rhythmically, but contract in a rapid irregular twitching manner, termed fibrillation, at a rate of 400 or more a minute. No true auricular contraction results.

The ventricular rate is absolutely irregular, either rapid or slow. The rate depends upon the degree of functional block established. The pulse and cardiac rates are, therefore, absolutely irregular, and the pulse rate then becomes irregular as to rate, rhythm and volume. The rate is usually about 120 per minute, but may be slower, 75 to 90 per minute, in treated or untreated cases. Exercise, fever, or anything tending to increase ventricular rate will not tend to abolish the irregularity, but rather tend to aggravate it. It may occur constantly over a long period of time, or in paroxysms.

With the rapid rates of fibrillation the diagnosis often becomes uncertain as it may be confused with frequent premature contractions. If one listens long enough, however, it may be possible to determine that some of the longer pauses are not preceded by an extra or early sound as would occur in premature contractions.

Because of the irregular responses of the ventricles to the fibrillating auricles the volume of blood ejected into the systemic circulation varies. This explains the production of variations in the volume of the pulse and the intermission or pause that also often occurs at the radial pulse. This, therefore, produces a pulse deficit as described under premature contractions. A pulse deficit of 10 or more less than the apex is almost always auricular fibrillation.

With premature contractions there will be intervals of normal rhythm with equally spaced pulse beats and cardiac sounds between the irregularities. No such regularity exists at any time with auricular fibrillation.

There is usually considerable disability in untreated cases of auricular fibrillation. It is a common condition. Some cases do very well over a long period of time, 30 years or more, when a slow ventricular rate is maintained spontaneously or by digitalis therapy.

Digitalis is the drug of choice. If slowing does not occur with adequate digitalization either the drug is not potent or hyperthyroidism is the underlying causative factor. Quinidine is now used less than formerly, though it is occasionally of value, especially in the paroxysmal type, or in the absence of cardiac failure. The presence of cardiac failure or long standing fibrillation is an indication for digitalis and a contra-indication for quinidine. Digitalis usually does not stop fibrillation but slows the ventricular rate so as to enable it adequately to maintain the circulation. The sudden transition from long standing auricular fibrillation to a normal mechanism, if possible, is undesirable because of the possibility of the production of emboli by whipping of a piece of mural thrombus within the auricle. Such an accident may, of course, occur during the course of fibrillation.

PULSUS ALTERNANS

Pulsus alternans is not a very common arrhythmia, though it may be found more frequently if we will but look carefully for it. It consists of a variation in the volume of the pulse so that there is an alternate strong and weak beat. The intervals between the beats are regular, and it should not be confused with the pseudo-alternation that occurs with pulsus

bigeminus. It may be possible to detect this variation with the palpating finger, but most frequently it can only be demonstrated with the use of the sphygmomanometer. After the pulse has been obliterated by pressure in the cuff, when the pressure is slowly released only one half of the pulse beats are felt to come through, and when the pressure is further released the full number of pulse beats is felt. The sounds over the brachial artery will alternate in intensity just after they become audible, or only the strong ones will be heard at this point. With a further release of pressure the alternate intensity will usually become audible. This type of examination should be routine in suspected or definite cardiac disease. Sometimes the alternation may be heard and felt only after premature contractions, but this has the same significance as the constant type.

In regularly beating hearts, not with paroxysmal tachycardia, pulsus alternans indicates heart muscle damage of a serious nature. It is not seen in normal hearts. It is very common in hypertensive heart disease, disease of the coronary vessels, and valvular heart disease. It generally occurs with rates over 90 per minute and disappears when the rate approaches 70 per minute. Its mechanism is thought to be due to myocardial fatigue as a result of damage, producing variations in the strength of contractions.

The prognosis with pulsus alternans is serious. Usually such patients have a life expectancy of one or two years, though exceptional cases may live for five years or more.

In the absence of cardiac failure patients with pulsus alternans should be carefully regulated as to activity. The coronary vasodilators such as theophylline (aminophylline 1 1/2 grains (0.10 gm.) three times daily) or theobromine (5 grains (0.3 gm.) three times daily), are recommended.

SUMMARY

It is seen that most of these arrhythmias can be diagnosed clinically at the bedside, while others can be strongly suspected when their mechanism and characteristics are understood. Sinus arrhythmia, partial heart block, premature contractions and auricular fibrillation can usually be diagnosed without any difficulty. Pulsus alternans can be recognized by the pulse and the use of the sphygmomanometer. Complete heart block can be suspected, often to a point of certainty, as can also auricular flutter and paroxysmal tachycardia. These latter three are those that are most difficult of absolute diagnosis and most frequently necessitate the use of the electrocardiograph.

Of these, sinus arrhythmia is always, and premature contractions are usually, without particular clinical significance. The others are of considerable diagnostic and prognostic importance.

REFERENCES

1. Christian, Henry A.: The Diagnosis and Treatment of Disease of the Heart. Oxford Press, New York, 1935.
2. Crummer, Leroy: Clinical Features of Heart Disease. Paul B. Hoeber, New York, 1930.
3. Herrmann, George R.: Synopsis of Diseases of the Heart and Arteries. C. V. Mosby Co., St. Louis, 1936.
4. Levine, Samuel A: Clinical Heart Disease. W. B. Saunders, Philadelphia, 1936.
5. Lewis, Sir Thomas: Diseases of the Heart. Macmillan Co., New York, 1933.
6. White, Paul D.: Heart Disease. Macmillan Co., New York, 1932.

THE PHYSIOLOGY OF HYPERTENSION*

HENRY LAURENS
NEW ORLEANS

The blood pressure varies as the product of the cardiac output and the peripheral resistance in the smaller vessels. To a minor degree it depends on the elasticity of the large arteries. The cardiac output depends on the venous return, the force and the rate of the heart beat. Other factors remaining unaltered, an increase in cardiac output raises, and a fall in output lowers, the blood pressure. The peripheral resistance is found chiefly in the tonically contracted arterioles, especially those of the splanchnic area and the skin, and to a less extent in the capillaries. Normally the greatest fall of pressure takes place while the blood is flowing through the arterioles; but a definite further fall occurs in the capillaries too. The peripheral resistance may be influenced by active changes in the caliber of tissue capillaries

*From The Laboratory of Physiology, Tulane University of Louisiana at New Orleans.

and by back pressure effects due to high venous pressure.

The degree of contraction, or tone of the arterioles, and probably also of the capillaries and veins, is under the continuous control of the vasomotor center which is continually sending out excitor impulses along vaso-constrictor fibers to the arterioles to maintain their normal degree of tone. The frequency of these impulses is modified by factors which influence the vasomotor center. Thus asphyxia, or the injection of histamine, increases the discharge. On the other hand, the injection of adrenalin may cause complete cessation of the discharge in sympathetic nerves for several minutes.

A depressor point is described 3 mm. behind the vasomotor center which, when stimulated, gives rise to a fall of blood pressure. Vasodilator fibers are found: in the sympathetic nerves, in the cranial and sacral autonomic, and in the posterior nerve roots.

Various factors influence the vasomotor center. Among them are: the higher centers, radiation from the respiratory center, CO_2 tension, and oxygen lack.

THE SINUS AND AORTIC NERVES

These are the afferent nerves principally responsible for stabilizing the blood pressure and preventing it from varying very much. The afferent nerves from the carotid sinuses and the aortic arch normally carry up a constant stream of afferent impulses which exert a tonic inhibitory influence on the vasomotor center. Section of either pair of nerves raises the blood pressure (more especially if the other pair has previously been cut). A rise of internal pressure in the carotid sinuses reflexly produces vaso-constriction.

Occlusion of the carotid arteries lowers the pressure in the sinuses, and so reflexly raises the blood pressure. Acute complete cerebral anemia, from occlusion of the carotids and vertebrals, may produce a huge rise of blood pressure, partly reflexly from the collapsed sinuses and partly directly because of CO_2 accumulation in the brain.

The sensitivity of the sinuses to internal pressure change is remarkable; a deviation of 10 mm. is sufficient to cause a reflex response. If the reflex effect on blood pressure of raising the pressure in the sinus from zero to various levels is noted and plotted, an S-shaped curve is obtained. There is a threshold value for the sinus pressure, below which no reflex is set up; at the other extreme there is a maximum effective pressure beyond which there is no additional response (this varies between 150 and 300 mm.). The curve is steepest in the normal blood pressure range, and it is interesting to note that the actual turning point agrees very closely with the normal average level of blood pressure in the particular tends to deviate Thus, when the blood pressure tends to deviate from the normal, the receptors in the sinuses will respond in a very sensitive manner, will affect the bulbar center appropriately, and will rapidly restore the blood pressure to its usual level.

The aortic nerves from the aortic arch function in exactly the same way as the sinus nerves and in a complementary manner.

In aortic regurgitation, the left ventricle is hypertrophied, the output of the heart is large, and the systolic blood pressure is abnormally high. This probably sets up an exaggerated depressor sino-aortic reflex at the height of systole, and great arteriolar relaxation; the pressure in the arteries consequently falls rapidly towards the end of systole. The reflex is thought to be partly responsible for the collapse of the pulse and the low diastolic pressure which are characteristic of the condition.

The peripheral nerves contain both depressor and pressor afferents, and by suitably selecting the type and strength of stimulation one or the other group can be brought into action.

In regard to the relation of the adrenal medulla to blood pressure, two facts are worth mentioning: there is, or may be, a constant secretion of adrenalin which may help to maintain arteriolar tone and blood pressure at rest; adrenalin secretion is reflexly modified (via the sinus and aortic nerves) according to the level of the blood pressure: a fall of blood pressure stimulates, and a rise of blood pressure depresses adrenalin secretion.

There is believed to be a cardiac center in the floor of the fourth ventricle in the region of the vagus nucleus. It is described as consisting

of two portions: an inhibitory center and an accelerator center.

The rate of the heart is controlled mainly by varying the degree of vagus tone (i. e. vagal inhibitory activity). The rate of the heart is mainly affected by: impulses from the higher centers; respiration; reflexly from the cardio-aortic area, the carotid sinuses and from the right auricle and great veins; O_2 and CO_2 content of blood; body temperature; intracranial pressure; adrenalin, thyroxin, and muscular exercise.

The sinus and aortic nerves are, again, mainly responsible for stabilizing the heart rate in the normal resting individual. Section of the sinus nerves or aortic nerves alone, usually results in cardiac acceleration. They therefore exercise at rest a tonic inhibitory influence, tending reflexly to retard the heart. A rise of internal pressure in the carotid sinuses or in the arch of the aorta reflexly slows the heart, a fall of internal pressure accelerates it.

External compression of the carotid sinus stimulates the adventitial sensory nerve endings and reflexly slows the heart. Very marked slowing may be obtained in arteriosclerotic subjects, probably because the sensory endings are pressed against the hardened media and so receive vigorous stimulation. The vagus nerve in man is comparatively inexcitable to mechanical stimulation.

The injection of adrenalin into an intact animal in large doses raises the blood pressure, and the heart is reflexly slowed via the aortic and the sinus nerves. After section of the vagi, adrenalin quickens the heart from direct action on the sympathetic endings. Large doses of adrenalin (1.5 c.c. in man) quicken the heart secondarily to increasing the metabolic rate.

CONTROL OF NORMAL BLOOD PRESSURE

I will now summarize the salient facts in regard to the control of normal blood pressure. In the normal resting body the blood pressure is steadily maintained within comparatively narrow limits. Other things being equal, the blood-flow through the brain will vary directly with the blood pressure. A pressure which is much below normal is unable to drive an adequate amount of blood to the brain against the force of gravity. If the blood pressure is raised excessively, it serves no useful purpose and imposes an additional burden on the heart. The desired constancy of the blood pressure is attained mainly reflexly by the buffer nerves, the aortic and sinus nerves, principally by means of the variable inhibitory influence which they exert on the cardiac and vasomotor centers and on adrenalin secretion. A rise of blood pressure at rest increases their inhibitory activity, a fall of blood pressure lessens it, and may also bring into action pressor fibers which are believed to arise from the aorta and carotid sinuses. In exercise the blood pressure rises, in spite of the sino-aortic nerves, mainly owing to increased cardiac output.

HYPERTENSION

Hypertension may be transient, periodic or chronic in nature. Most of the transient attacks may be regarded as physiological in character; exercise, digestion and emotions playing the dominant role.

Hypertension has been classified in various ways; I shall attempt to consider it from the physiologic viewpoint of: disturbances in cardiac output, vascular changes, and disorganization of cardiovascular reflexes. Observations indicate that increased heart rate produces at most only a moderate hypertension which affects systolic pressure chiefly. This is the case in thyrotoxicosis, for example, where the cardiac output is almost double the normal. Systolic pressure is frequently elevated, but, on the other hand, it may be quite within normal ranges. The diastolic pressure is seldom elevated; hence, a large pulse pressure rather than hypertension is the most constant vascular phenomenon. The final circulatory effects, like the metabolic, resemble those of exercise in many respects. In both, the metabolic rate is increased; in both, the cardiac output augments in response to the greater need for oxygen. Also the tendency for increased cardiac output to elevate the arterial pressure is counter-balanced, more or less, by pronounced dilatation of blood vessels which incidentally favors a greater blood flow through organs and promotes radiation of heat from the skin.

The blood pressure is affected similarly when the circulating volume is increased, but

the compensatory mechanisms are somewhat different. There appears to be no question but that a continued abnormal intake of fluid, such as obtains in heavy beer drinkers, leads successively to diastolic distention, increased cardiac output, hypertrophy and hypertension. Many patients with polycythemia show no increase in blood pressure or cardiac hypertrophy and the cardiac output does not appear to be increased, but in others there is systolic hypertension so that the cardiac factor is significant.

Increased peripheral resistance is the most common cause of hypertension in man. This may be due: (1) to increased tonic contraction of normal arterioles followed after a prolonged period by morphological changes, or (2) to primary inflammatory and degenerative changes of the arterioles by virtue of which their lumen is diminished or obliterated. In addition, arteriosclerosis of the aorta and large branches may increase arterial pressure as a result of secondary reactions.

Generalized spasm of arterioles accounts for transient hypertension associated with emotional disturbances, cerebral anemia, asphyxial and anoxemic conditions and with increased intracranial pressure; also the acute hypertension associated with eclampsia and uremia. Vasomotor spasm may be due to psychic, reflex, mechanical or chemical actions upon the vasomotor center or upon the peripheral mechanisms themselves.

The proximity of the emotional and autonomic centers in the diencephalon makes it conceivable that an inordinate bombardment of the vasomotor center can occur during emotional stress and as a result of nervous strain, thus offering an explanation for the frequency of hypertension in nervous states. Stimulation of epinephrin secretion has also been postulated. There have been several recent reports of cases of paroxysmal, and later continuous, hypertension in which paraganliomas of the adrenal medulla have been shown to be the offending etiologic agent, the removal of which leads to recovery. In one case crystalline epinephrin was recovered from the tumor. Hypertension is an outstanding sign in the syndrome of pituitary basophilism, in which there is frequently, if not always, involvement of the adrenal cortex.

Reflex bombardment of the vasomotor center may account for transient and paroxysmal hypertension associated with tabetic crises, angina pectoris and other painful conditions. Deprivation of blood supply to the kidney, pancreas or heart, may also give rise to reflexes causing widespread vasoconstriction. Persistent elevation of systolic pressure can be produced experimentally in dogs by partial reduction of the renal blood flow. General anoxemia, changes in cerebral blood supply and increased intracranial tension, cause a stimulation of the vasomotor center. It is therefore conceivable that cerebral anoxemia due to spasm or sclerosis of the cerebral vessels may also be a factor, particularly in cases that show changes in retinal vessels. The trend of opinion is that many cases of so-called essential hypertension, certainly in their initial stages, are due to a functional spasm of the arterioles. This does not mean that arteriolar or arterial lesions may not develop eventually. According to one conception, such continued arteriolar contraction leads successively to hypertrophy, exhaustion and degeneration of the arteriolar muscle, followed by fibrosis, an effort to replace degenerated muscle.

The cause, or causes, of such prolonged spastic contractions have been sought but not found. In addition to various nervous factors, many chemical substances, products of metabolism and of extraneous agents, have been carefully studied as possible causative factors. No crucial evidence has been presented that such substances as urea, uric acid, guanidine or various amines, are concerned, either in acute hypertension such as occurs in uremia and eclampsia, or in the more chronic form associated with renal insufficiency. Cholesterol and sodium chloride retention, an abnormal calcium-potassium balance, excess of epinephrin, toxins of bacterial and gastrointestinal origin and many other chemical substances have been considered and studied, but no conclusive evidence of their guilt has been found. There are pressor substances in blood, but hypertensive blood seems to contain no more than normal.

PATHOLOGIC STUDIES

The conception that a generalized arteriolar

sclerosis occurs in essential hypertension is prevalent. Pathologic studies have shown that inflammatory and degenerative changes of arterioles are found, in the order of frequency and severity, in the kidney, spleen, pancreas, liver, brain, retina and gastrointestinal tract. But attention has repeatedly been directed to the fact that such lesions are often limited to a few of these organs and when more extensively distributed, do not produce sufficient resistance to peripheral flow to account for the extreme hypertension encountered. Physiologic experiments have demonstrated that an extreme degree of vascular narrowing must occur, and that in the splanchnic area, in order to cause even a temporary great elevation of pressure. Unless, therefore, the arterioles of the abdominal organs are widely involved, morphologic changes alone cannot account for the hypertension. In accord with this interpretation are the facts that diastolic blood pressure fluctuates considerably and can be significantly decreased by bodily and mental relaxation, by diet and by the use of vasodilating drugs. It has been shown, however, that thickening occurs in arterioles of skeletal muscle obtained by biospy from cases of hypertension, and a correlation exists here with the postmortem findings in internal organs. Such data indicate that structural changes may occur more generally than has been believed. Whether these changes are primary and initially cause hypertension or whether they are the result of prolonged hypertension due to functional causes, remains a question.

Since clinical hypertension is frequently associated with sclerosis of palpable vessels and since arteriosclerosis of the aorta and its branches is found postmortem, it was thought for a long time that the decrease in elasticity involved was physically responsible for hypertension. It may now be regarded as demonstrated that this is not the case, for arteriosclerosis and hypertension frequently occur independently, and experiments have shown that unless the force of cardiac contraction be increased secondarily, decreased arterial elasticity does not cause much elevation of systolic pressure; on the contrary, its chief action is to increase the pulse pressure.

The possibility remains that initial arteriosclerotic changes involving the aorta and sinus caroticus may produce degeneration of nerve terminals and thus permit generalized vasoconstriction owing to removal of moderating reflexes from these regions. This possibility is supported by the claims: (1) that degeneration of nerves has actually been demonstrated in arteriosclerosis and hypertension, and (2) that section of these nerves in animals leads to hypertension, which may or may not be so, and I for one, doubt it. This possibility is not supported by the clinical demonstration that the sinus caroticus reflex is no different than in normal, or if anything, is more easily evoked by pressure than in normal subjects; and no correlation seems to exist between hypertension and pathologic changes in the sinus caroticus region. While this suggestion therefore requires confirmation, it serves to direct attention to a fact that stabilization of blood pressure at a normal level does not necessarily imply constant cardiac output and peripheral resistance but a perfect coordination between the two. Every alteration in the rate and output of the heart and every variation in the caliber of the peripheral arterioles should be accompanied by an alteration in pressures. Such, however, is not the case in normal persons; on the contrary, the blood pressures tend to remain quite constant. This stability is attained through well-balanced compensatory mechanisms. Thus, if a primary vasoconstriction occurs and arterial pressures have a tendency to rise, reflexes are set up from the large vessels which slow the heart, reduce its minute output and so restore the pressure to normal levels. If the heart accelerates and increases its discharge, as it does during exercise, thereby tending to increase the systolic and diastolic pressure, a reflex dilation of the arterioles is induced which tends to restore pressure relations to their normal level again. In these and similar ways, the compensatory reflexes prevent great fluctuations in arterial pressures. When they are not functioning properly, the pressure relations are continually high.

It must not be inferred that decreased elasticity of the larger arteries does not modify the arterial pressure relations in clear-cut cases

of arteriosclerosis or that the dynamics of the arterial circulation are fully accounted for on a basis of increased peripheral resistance alone. A large proportion of cases with hypertension have a large pulse pressure; the diastolic pressure being elevated relatively less than systolic. This is contrary to dynamic effects produced by increased resistance alone. Consequently, contributory factors must exist which modify pressure relations. Increased systolic discharge by the hypertrophied ventricle is perhaps one factor. The diminished extensibility of the arterial system may act to reduce the diastolic pressure and to accentuate the pulse pressure.

ARTERIOLAR SCLEROSIS

The commonest disease in which deviations from the normal blood pressure are seen is arteriolar sclerosis. In this condition there is increase in the peripheral resistance which must be overcome if an adequate circulation is to be maintained. The elevated peripheral resistance shows itself by heightened diastolic pressure. This may be recorded at 90 to 160, or occasionally more, and constitutes what is commonly called true hypertension. This leads to ventricular hypertrophy and as long as the heart can increase its contractile force so as to add, after the valve is opened, one-half the pressure necessary to open the aortic valve, and thus maintain an adequate pulse pressure and an adequate circulation, the individual may suffer no manifestations of hypertension. This is why hypertension is frequently not manifested until late, or only discovered by accident in a routine examination. When the heart begins to fail it is shown by a decrease in the systolic pressure which necessarily means that the pulse pressure is lower, since systolic pressure is, physiologically, only the sum of diastolic and pulse pressures. Since the diastolic pressure does not fall, because it cannot, the decrease in systolic pressure is totally at the expense of the pulse pressure and must eventuate in circulatory failure. As long as the individual's hypertrophied heart can maintain a pulse pressure which is approximately one-half as great as the elevated diastolic pressure a fairly adequate circulation can be maintained. This is why occasionally patients are seen who carry on for years with diastolic pressure of 110 to 120, and systolic pressure of 170 to 180.

It is necessary to distinguish the elevated systolic pressure which occurs in aortic sclerosis from true hypertension as described above. When, with advancing age in certain individuals the aorta and great vessels lose their normal elasticity there is gradual elevation of the systolic pressure with little, or no elevation, of the diastolic pressure. This characteristic deviation from normal relationships of blood pressure also is an adaptation to permit the patient to maintain an adequate circulation even after loss of the elastic recoil of the great vessels which normally occurs at the beginning of diastole. The sudden distension of the elastic aorta at systole and its recoil after closure of the aortic valve at the start of diastole are important factors in propelling the blood because they assist in permitting a more gradual fall of pressure through the arterial tree.

Unless there is concomitant peripheral sclerosis to increase the peripheral resistance, the diastolic pressure usually remains normal, and there seems to be little additional work thrown upon the ventricle, because the heart is usually not enlarged. This type of vascular disease, with its characteristic adjustment in blood pressure, is the type seen most often in elderly people and is compatible with normal expectancy of life. This type of hypertension may pass into a malignant one. In a number of instances the splanchnic and renal sclerosis suddenly develops into a malignant and progressive renal disease which, after a brief or protracted, occasionally stormy course, leads to renal insufficiency and true uremia; the genuine contracted kidney. The physiology of the sudden turn in the course of the disease is not fully understood. It is probably not due to impaired kidney function.

CONCLUSIONS

High blood pressure is frequently a symptom. The high pressure in certain cases of suprarenal tumors may be considered a symptom of suprarenal hyper-activity, red hypertension as a symptom of general or splanchnic sclerosis, while in malignant sclerosis the pale hypertension is not a mere symptom, but the cause of the fatal disease; it is the cause of the con-

tracted kidney. It is therefore, in itself, in the late stages, also not a compensatory phenomenon. In red hypertension, if one accepts the assumption of a decreased arterial dilatability as the cause of the pressure elevation, the blood pressure increase becomes significant as a compensatory mechanism. Through it is secured a normal nutrition of the organs involved. As Volhard asks, is it not the cause of the favorable span of life and the practically normal capacity of these individuals? Would not the blood supply to the kidneys as well as to other organs suffer if the insufficiency of the peripheral pumping mechanism of the small arteries were not compensated for by a high pressure and increased work by the heart? As Volhard states, the vascular resistance of the kidney can be appreciably raised. As the renal vessels form more and more elastic tissue to replace disappearing musculature, they become less and less capable of dilatation and the free vasomotor play diminishes; the renal blood supply will more and more depend on the blood pressure which becomes more stable at a high level. Volhard believes that the utility of this apparent compensatory arrangement becomes doubtful when one considers the minor vascular changes in the kidneys to be the result of the wear under normal pressure, and their further development and the increased tone of the arterioles, to be the result of the vascular hyperdistension. There is, therefore, a vicious circle rather than a compensatory mechanism, But, granting that at the end a vicious circle is being dealt with, I venture to say that practically all elevated blood pressures are in their beginnings, and up to reasonably near the end, examples of the heart and vasomotor system attempting to compensate and to stabilize at new and higher levels.

REFERENCES

Wright, S.: Applied Physiology, 6th, Ed. 1936.

Wiggers, C. J.: Physiology in Health and Disease, 1934.

Volhard, F.: Elevated Blood Pressure. In the Kidney in Health and Disease, 1935.

Modern Concepts of Cardiovascular Disease. Vol. 5, May, 1936.

THE PROBLEM OF VASCULAR DISEASE*

J. E. KNIGHTON, JR., M. D.
SHREVEPORT, LA.

The questions involved in a discussion of vascular disease obviously embrace a field too wide for detailed consideration in a paper of this type. The title was selected because it seemed desirable to mention in a very brief manner certain conditions which otherwise would have been excluded. In this latter group we find Raynaud's disease, of infrequent occurrence, but a condition which produces disability because of the great pain associated with the attacks. In its typical form the disease is a bilateral affection, without pathology in the blood vessels themselves, the pain being produced purely by spasm of the arteries with resultant ischemia and anoxemia of the extremities. Within recent years considerable relief has been afforded these sufferers by the intravenous administration of typhoid vaccine. The artificial hyperthermia associated with the reaction following this therapy apparently is responsible for relaxation of the spastic vessels with resultant improvement in symptoms. Lehman[1] has suggested elevation of the environmental temperature as a more simple procedure for the relief of arterial spasm, and indeed the use of pre-heated air about an extremity does seem efficacious. Of the drugs which have been used in this condition the most promising is acetyl-beta-methylcholine. The work of Goldsmith [2] indicates that this agent, when given by mouth, provides definite relaxation of spastic arterioles, as indicated by elevation of the skin temperature, with quite prolonged vaso-dilating effect, safety, and ease of administration. Little, if any, benefit is derived from this therapy in conditions where actual pathology exists in the blood vessels.

BUERGER'S DISEASE

Buerger's disease, or thrombo-angiitis obliterans, is a similar condition in that the vessels of the extremities are involved, and is apt to be bilateral. In this instance, however, there

*Read before Fifth District Medical Society, Monroe, La., December 11, 1936.

is arterial pathology, and the lesions do progress to a degree which permits gangrene of the peripheral structures. In the past, drug and physical therapy have been beneficial in only a small percentage of cases, and there was a definite need for the apparatus introduced by Reid and Herrmann [3] which provides passive vascular exercise. This instrument alternately exerts positive and negative atmospheric pressures upon the extremity which is being treated, and this aids the flow of blood to and from the tissues of the affected part. Good results have been reported, not only by the original investigators, but also by various workers throughout the country.

It is pointed out by the originators that the most dramatic results with the pavaex apparatus are obtained in those instances of acute arterial occulsion. The effects in thromboangiitis obliterans and arteriosclerotic conditions are not optimum, yet there has been a definitely progressive step. This is expected to prove quite effective in aiding to minimize, if not prevent, gangrene from arterial occlusion, diabetic conditions, and lesions of lesser importance. It must be noted that much harm may be done if cases for treatment are not properly selected, and active inflammation and phlebitis must be carefully sought for, as these conditions as well as others constitute contraindications.

Another inovation in the treatment of these arterial conditions is an electrically driven mobile bed suggested by Sanders [4]. With the patient upon the bed the head and feet are alternately lowered and elevated, thus providing passive filling and emptying of the vessels by force of gravity. This bed is so constructed that it is adjustable and is said to be particularly efficacious in the management of cardiac patients with edema.

SURGICAL INTERVENTION

There has been much attention given the surgical relief of vascular conditions such as those mentioned. A recent critical review by de Takats [7] is most interesting. The results obtained by paravertebral injection of the sympathetic nerves with alcohol were gratifying, but the technical difficulties are stated to be as great as those of actual resection of the sympathetic nerves or ganglia. Evidently the latter procedures are increasing in popularity, and several types of operations are discussed. The results obtained by several authors are quoted, all of which are satisfactory. It is pointed out that sympathetic ganglionectomy in carefully selected cases provides the maximum degree of permanent vasodilation of the collateral circulation. Microscopic study of the excised ganglia has revealed a wealth of pathology, varying from simple degeneration to malignant changes. It is possible then that instead of being merely a measure for relief these operations may be directed toward the actual causes of many of the vascular diseases.

MIGRAINE

The illness known as migraine is very distressing to its victims, and is relatively frequent in its occurrence. The etiologic factors concerned with the production of this irregularly periodic cephalalgia have been and are the subjects of extensive investigation. Changes in blood pressure, spinal fluid pressure, alterations of pressure in the various meningeal vessels, allergy, endocrine dysfunction and many other factors have been suggested as possible or probable caustive agents. Most authorities believe that whatever the nature of the exciting cause of migraine the actual pain is produced by some alteration in vascular function. Pool [5] suggests that the vessels of the dura may be the offenders as a result of perivascular edema with pressure upon nerve filaments. He [6] had previously noted that the dural vessels respond by constriction to intravenous injections of ergotamine tartrate. In this action the vessels of the dura are at variance with those of the pia and of the cerebrum which show no constriction. In clinical work I find that ergotamine tartrate (gynergen) affords one of the best agents for the relief of migraine. A word of warning would not be out of place, for an individual with sclerotic lesions of the peripheral vessels serious results, including gangrene, may follow the indiscriminate use of this preparation of ergot.

ARTERIAL HYPERTENSION

The attention of the medical world has long

been focused upon arterial hypertension. The rise of blood pressure secondary to sclerotic changes in the renal capillaries has been recognized for some time, but the correlation of primary hypertension and endocrine dysfunction is a matter of comparatively recent knowledge. My personal interest in these relationships was greatly increased when in February, 1935, it was my privilege to see with Dr. W. B. Allums a most interesting case:

CASE REPORT

The patient was a white female, 69 years of age, who had always enjoyed the best of health. She stated that for several weeks she had noted a dull aching pain in the left kidney area, and that at times a mass could be felt in the upper left abdomen. There was no fever, and no other complaint. Examination revealed a skin which was waxy and dull in appearance, though anemia was not present. A firm mass, which was palpable in the upper left quadrant of the abdomen, was very slightly tender and movable. It could be elevated to the kidney area without difficulty, and was about twice the size of a normal kidney. Urologic studies were negative except that urography revealed abnormalities of the upper calyces of the left kidney, interpreted as pressure defects. A tentative diagnosis of solitary cyst of the left kidney was made. No other abnormalities were noted except that the blood pressure was found to be elevated, the reading being 200/100. Hypertension had been known to exist for six or eight years. Operation was advised, and upon exposing the left kidney a cystic tumor was found, extra-renal in origin. The tumor was elliptical in shape, covering the upper and lateral aspects of the kidney. It was separated from the kidney without difficulty and without hemorrhage, and the kidney was not disturbed. A most uneventful recovery was made. The pathologist reported a cystic necrotic tumor containing adrenal tissue, without malignant changes. After the operation, in about six weeks, the skin had cleared up remarkedly and the blood pressure was 160/90. Since that time the blood pressure has remained at or below this figure and the patient has been in excellent condition.

Kremer [8] has recently reported the incidence of hypertension and arteriosclerosis in a 14 year old child. Fatal termination of the condition was due to a cerebral vascular accident. Necropsy revealed the presence of medullary tumors of the adrenal glands, the left weighing 70 grams. On the basis of the history Kremer felt that everything except the adrenal pathology could be eliminated as the primary causative agent, and concludes that the vascular disease was entirely caused by the adrenal tumors. The presence of pituitary gland changes is suggested because of abnormal hair and fat distribution. Graef, Bunim, and Rottino [9] have reported a similar case in which the adrenal tumor was carcinoma, and in which an adenoma of indeterminate type was present in the pituitary gland. The effects of adrenal pathology upon the pituitary gland are discussed, but these authors arrive at no conclusions.

RADIATION THERAPY

The work of Hutton [10], [11] on radiation therapy in hypertension came to my attention early last year. On the hypothesis that changes in both the pituitary and adrenal glands are jointly responsible for the production of primary hypertension, and believing that these changes were in the nature of hyper-function, Hutton administered x-ray therapy over the pituitary and the adrenal areas. The dosage first used was subsequently reduced, and his patients are now being given over each area 100 or less R units produced with 120 kilivolts, 5 milliamperes and filtration with copper and aluminum. The results reported are quite gratifying, 74 per cent of 134 cases showing improvement both in subjective symptoms and in reduction of blood pressure. Others are quoted as being improved in symptoms without reduction of blood pressure. Hutton does not present this as a cure for hypertension, but as a possible aid which deserves further investigation. He states that little or no benefit is to be expected in individuals who present well marked sclerosis, and that the best results are obtained in the comparatively early cases.

My experience with radiation in hypertension is limited to three cases. The results obtained have been far from remarkable yet do indicate to me that this may be, in carefully selected cases, a very definite aid.

CASE REPORTS

One patient was an elderly female with advanced arteriosclerosis, and therapy was discontinued after failure of three treatments to afford any relief from symptoms or to provide any reduction of the blood pressure which was 260/120. Another patient was a female in the fifth decade of life, with moderate arteriosclerosis, but no evidence of renal impairment. The blood pressure was reduced from 240/140 (at which level it had

been constant for several years) to 190/116 by a series of four treatments over the adrenal glands alone. During the following seven months the pressure gradually returned to 220/120, but with one treatment, using the technic of Hutton, these figures were reduced to 176/100. One month later the systolic pressure was still below 200 mms. My third patient was a young woman 28 years of age in whom hypertension had been known to exist for about two years. No other abnormalities were present, the vessels in good condition, normal renal function, and basal metabolic reading of zero. The blood pressure had been above 220 systolic on each of several observations. Two treatments were given and the pressure remained below 200 for more than four months. After this period two additional treatments were given with an interval of one week. She has not been seen for two months, but is to return when the pressure again reaches too high a level.

Surgery of the sympathetic nervous system has invaded the field of therapy for the relief of hypertension. The work of Crile and Crile [12] is outstanding, and the results reported are excellent, but it is unlikely that these procedures will receive widespread adoption within the near future.

CORONARY DISEASE

Arteriosclerosis should likely be classed as the most important of vascular lesions, and sclerosis of the coronary vessels is the predominant factor to justify such a classification. The senile heart with fibrosis and muscle degeneration is dependent upon these vascular changes, as is the distressing symptom of angina pectoris which is complicated too frequently by coronary thrombosis. These subjects have received so much attention recently that nothing further will be mentioned at this time, except to emphasize the importance of recognizing these lesions in the earliest stages possible, and to repeat that the patients must be made thoroughly cognizant of their condition in order that cooperation may be obtained. It is of the greatest importance that we not be so zealous in our search for coronary pathology that other lesions which may cause precordial pain are overlooked. Most of these are familiar and simple conditions, such as a recent case well illustrates. The patient was a middle aged woman who had become almost an invalid because of attacks of pain in the precordium, left shoulder and arm. The shoulder muscles were atrophic from disuse. A diagnosis of angina pectoris had been made elsewhere five years ago and the patient kept comfortable with opiates. Physical examination of the heart and electrocardiography revealed nothing of importance, but an x-ray of the shoulder demonstrated a densely calcified sub-acromial bursa. The diagnosis then was very simple. This case is mentioned to stress the hope that we may use every possible aid to determine the presence of coronary disease and that none of our patients will be subjected to undue suffering and the necessary physical limitations unless the diagnosis of angina pectoris is correct.

SUMMARY

Some of the more recent ideas regarding the pathology and treatment of certain of the vascular diseases are discussed. Three cases of hypertension treated by x-ray are briefly reported. A plea is made for elimination of the erroneous diagnosis of coronary disease.

BIBLIOGRAPHY

1. Lehman, E. P.: A suggestion for simple treatment of acute arterial spasm, Am. J. Med. Sci., 190:459, 1935.

2. Goldsmith, Grace A.: The effectiveness of acetyl-b-methylcholine given by mouth as a vasodilation agent, Ann. Int. Med., 9:1196, 1936.

3. Reid, M. R., and Herrmann, Louis G.: Non-operative treatment of peripheral vascular diseases. Ann. Surg., 102:321, 1935.

4. Sanders, C. E.: Cardio-vascular and peripheral vascular diseases. Treatment by a motorized oscillating bed, J. A. M. A., 106:916, 1936.

5. Pool J. L., Von Storch, T. J. C. and Lennox, W. G.: Effect of gynergen on cerebrospinal fluid and blood during migraine headache, Arch. Int. Med., 57:1, 1936.

6. Pool, J. L., Mason, C. I., and Forbes, H. S.: The cerebral circulation, Arch. Neurol. & Psychiat., 32:1202, 1934.

7. Scupham, G. W. and de Takats, Geza: Peripheral vascular disease: A review, Arch. Int. Med., 58:531, 1936.

8. Kremer, D. N.: Medullary tumor of the adrenal glands, with hypertension and juvenile arteriosclerosis, Arch. Int. Med., 57:999, 1936.

9. Graef, Irvin, Bunim, J. J., and Rottino, A.: Hirsutism, hypertension and obesity with carcinoma of the adrenal cortex: Indeterminate pituitary adenoma and selective changes in the basophils of the hypophysis, Arch. Int. Med., 57:1085, 1936.

10. Hutton, James H.: Radiotherapeutic treatment of hypertension and diabetes, Radiol., 24:330, 1935.

11. Hutton, James H., Culpepper, W. L., Olson, E. C.: Response of essential hypertension and diabetes mellitus to small doses of x-ray, Arch. Phys. Therapy, 17:7, 1936.

12. Crile, G., and Crile, G., Jr.: Blood pressure changes in essential hypertension after excision of the celiac ganglion and denervation of the aortic plexus, Cleveland Clin. Quart., 3:268, 1936.

NEW ORLEANS
Medical and Surgical Journal

Established 1844

Published by the Louisiana State Medical Society under the jurisdiction of the following named Journal Committee:

H. W. Kostmayer, M. D., *Ex-Officio*
For one year: S. M. Blackshear, M. D.
Chailie Jamison, M. D.
For two years: W. H. Seemann, M. D., Chairman
Maurice J. Gelpi, M. D., Secretary
For three years: John A. Lanford, M. D.

EDITORIAL STAFF

John H. Musser, M. D.—*Editor-in-Chief*
Willard R. Wirth, M. D.—*Editor*
G. C. Anderson, M. D.—*Associate Editor*

COLLABORATORS—COUNCILORS

H. E. Bernadas, M. D.
Daniel N. Silverman, M. D.
C. C. DeGravelles, M. D.
M. D. Hargrove, M. D.
J. B. Vaughan, M. D.
R. McMahon, M. D.
C. A. Martin, M. D.
J. T. Cappel, M. D.

Paul T. Talbot, M. D.—*General Manager*

1430 Tulane Avenue

SUBSCRIPTION TERMS: **$3.00** *per year in advance, postage paid, for the United States;* **$3.50** *per year for all foreign countries belonging to the Postal Union.*

News material for publication should be received not later than the twentieth of the month preceding publication. Orders for reprints must be sent in duplicate when returning galley proof.

THE JOURNAL *does not hold itself responsible for statements made by any contributor.*

Manuscripts should be addressed to the Editor, 1430 *Tulane Avenue, New Orleans, La.*

THE MORTALITY OF CANCER

In spite of the efforts that have been made by the American Society for the Control of Cancer, an organization which is represented in every state in this country and which, in the State of Louisiana, is working with the Cancer Committee of the State Medical Society, deaths from this insidious disease continue to take more than 140,000 lives in the United States each year. Cancer has gone from seventh place in the cause of death to almost the top ranking position. It and deaths from "accidents" have increased, whereas nearly every other important cause of death has fallen off. The active and forcible Committee for the Control of Cancer under the chairmanship of Dr. Lanford is helping to teach the lay people as well as the medical profession the importance of the early recognition of this devastating disease. Again it hardly seems necessary to accentuate and stress in this connection the importance of the yearly health examination, an examination which, as mentioned by Carter Wood at the recent meeting of the Annual Congress of Medical Education and Licensure, should be a complete one. It should not be merely a perfunctory examination of the heart and the taking of the blood pressure, but particularly it should include a careful palpation of every woman's breasts past the age of 30; a vaginal examination should be part of the routine, as well as a rectal examination in both sexes. This for the doctor's part; for the patients' part they should be instructed that any lump in the breast, any unexplained bleeding or any visible or palpable growth should be investigated at once by a physician.

It is only through education that cancer is likely to be controlled to any very great extent and every resource should be called upon to bring about a lowering of the death rate in this disease. Tuberculosis is a splendid illustration of what can be done by widespread education in the importance of the early signs and symptoms of the disease.

On the first advertising page of the Journal will be seen the notice of the Women's Field Army of the American Society for the Control of Cancer, a nation-wide organization of the women of America who are planning to conduct a relentless war against cancer. The Cancer Committee of the State Society approves of what these women are attempting to do. It should form a splendid ancillary group which may be of assistance and help in the thankless efforts of the Cancer Committee through their organization. Anything or any group that can bring more pressure to publicize the importance of this disease, cancer, should make, if properly functioning, a valuable addition to the organizations attempting to make known the importance of malignancy as a cause of death.

POST GRADUATE MEDICAL ASSEMBLY

For the last time for some months at least, an editorial on the subject of the approaching convocation in New Orleans, will be published in this Journal. The editor believes that this approaching meeting will offer a magnificent opportunity to the medical profession of Louisiana and the South to learn what is new in medicine or to acquaint itself with progress in various medical specialties. It is for this reason that we have kept harping on this particular subject. For the last time we stress again the obvious advantages of any post-graduate medical assembly and this one in particular with its large group of distinguished speakers, with its opportunities for scientific discussions and with its, by no means to be despised, social aspects.

NUMBER OF PRACTITIONERS IN THE UNITED STATES

At the recent meeting of the Annual Congress on Medical Education and Licensure it was pointed out that, largely as result of a survey of medical schools made by the Council on Medical Education and Hospitals, there had been a decrease the last two years in the number of medical students registered in the schools of the country. This decrease amounts to 12 per cent in the two years. It represents the result of the Council pointing out to many medical schools that their facilities, during the depression, were over-taxed and inadequate to give medical students proper medical education. Medical schools have cooperated well with the Council in limiting the number of students they admit for a satisfactory medical training. A decrease of 12 per cent represents a very real cut in the number of practitioners who will appear as doctors in the next few years.

Another aspect of the diminution in the number of men who will come up for licensing by State Boards of Medical Examiners had to do with a marked decrease in the number of men who are studying in the European Universities. From the peak of nearly 3,000 such students a few years ago there has been a tremendous drop. This has been brought about by the enlightened policy of the licensing boards to limit opportunities to those men who have graduated from a school which is able to train properly the prospective American physician. Furthermore, the licensing boards of many states have taken the attitude that there must also be considered the important factor of an over-production of physicians, and this aside from inequalities in education, because many European trained students lack not only adequate teaching in the basic sciences but are not subsequently properly fitted through clerkship in the wards and internship after graduation to apply clinically what they have learned dogmatically.

The efforts of organized medicine to maintain high standards in the medical profession necessarily will bring about a diminution in the number of future doctors. This is encouraging, because at one time it appeared as if the medical profession might be swamped by a large number of embryo physicians entering its ranks, a number much greater than there is need.

INJECTION TREATMENT OF HERNIA

For a hundred years it seems that the injection treatment of certain types of hernia has been practiced. For a while it was quite popular and then came a period of time when it was discarded and then about fifty years ago there was a recurrence of the interest in this particular therapeutic measure. Lately this method of controlling hernia has again been given considerable thought by operators, most notably in Europe and South America.

Crohn* writes that the injection treatment of hernia has been practiced very frequently by quacks. He states that the great majority of reported cases have not been followed-up so that the percentage of cures attributed to injection of a hernial sac is erroneous. There is a primary or early excellent result but if these cases are followed over a period of time it is found in many instances the hernia recurs. He

*Crohn, N. N.: **The injection treatment of hernia, J. A. M. A., 108:540, 1937.**

doubts very much the report of some of the foreign observers that they have had figures up to 100 per cent cured. One of the most remarkable series of cases is that of Mestre who lists 15,000 cases in which injections were made over a period of twenty years with a 98 per cent cure, but Crohn reiterates there is no mention of follow-up.

The paper follows, after the introductory review of literature, with the reports of experiments by the author. He devised experimental studies which showed that the injected chemical irritants produced an acute inflammatory reaction which subsequently is replaced by chronic inflammatory changes and eventually resulted in the formation of fibrous connective tissue. The experimental work proves the method is capable of effecting pathologic changes which produce scar tissue and block up the hernial tract. Later in his communication Crohn says that the cases for this method should be carefully and suitably selected. Best results occur in patients with oblique hernias readily reducible and readily kept reduced by a truss. Small recurrent and small direct hernias may be successfully treated. The sclerosing solution that he used consists of phenol, forty parts; 95 per cent alcohol, thirty-five parts; oil of thuja, twenty-five parts. Following injection occasionally there is some swelling of the scrotum and its contents.

The method is advantageous particularly for those who do not wish to have surgical operations to relieve their difficulty and would otherwise have to wear a truss. Unfortunately abuse is easy and might result in general condemnation of a method which has certain definite values.

HOSPITAL STAFF TRANSACTIONS AND CLINICAL MEETINGS

THE NORTH LOUISIANA SANITARIUM

The meeting of the North Louisiana Sanitarium Staff was called to order by the President on January 26, 1937, with twenty members and several guests present. After disposal of routine business, attention was turned to the scientific program.

Dr. P. D. Abramson presented the end results of several cases of skin grafts and a series of lantern slides, giving the classification of the various methods of skin grafting and the advantages of each. The cases were discussed by Dr. Oxford, who presented technic and care of skin grafts. Further discussion was given by Drs. Nicholas and Rigby.

Officers for 1937 were elected as follows:

Dr. J. M. Gorton.....President
Dr. L. F. Gray.....Vice-President
Dr. H. M. Trifon.....Secretary

H. M. Trifon, M. D., Sec.

SCHUMPERT SANITARIUM

A meeting of the Schumpert Staff was called to order by the President, Dr. T. J. Fleming on February 9, 1937. After partaking of a very delicious dinner, the members met in the lecture hall and the minutes of the previous meeting were read and adopted.

The scientific program was as follows:

Dr. C. S. Sentell read a paper on "Tubercular Peritonitis". The most essential points of his paper were the division into the acute and chronic forms and method of treatment, also the value of roentgen ray in treating these cases. The following doctors discussed the paper: C. R. Gowen, George Wolfe, O. C. Rigby, J. H. Cassity and O. A. Eaddy.

Dr. V. P. Blandino presented a short paper on "Treatment of Pneumonia." In this paper he discussed the use of serum therapy in the various types. The pneumothorax treatment was not recommended by the essayist. Dr. N. G. Bender opened the discussion and was followed by Doctors George Wolfe, C. R. Gowen, Oxford and Captain Byrnes.

The Memorial Committee reported on the death of Mr. S. C. Garrett, the father of Doctors B. C. and George Garrett.

The Hospital report was read by the secretary.

W. L. Atkins, M. D., Sec.

HUTCHINSON MEMORIAL CLINIC

Symposium on Petrositis: Conducted by the Department of Otolaryngology, Dr. R. Hume, presiding.

Pathology of Petrositis (Dr. H. J. Schattenberg, Department of Pathology): From a pathologic standpoint petrositis may be defined as an inflammatory process of the petrous or pyramid portion of the temporal bone quite often associated with middle ear or mastoid infection. The pathology varies with the anatomic structure of the bone involved and this anatomic structure again varies at different age periods. During infancy and early childhood the process of air cell formation or pneumatization of the petrous bone is begun but

does not reach its completion until puberty. The mastoid air cells are fairly well formed by the age of four. In the very young, bone marrow function, both red and white, is rather extensive and the petrous portion of the temporal bone shares in this activity. It is possible, therefore, that this location may be the seat of a special type of petrositis due to a marrow cavity involvement which had better be termed osteomyelitis. In the adult, however, in whom marrow centers are no longer functioning in this locality and pneumatization or air cell formation has taken place, we now see a different type of petrositis, that is, an ordinary air cell or bony tissue inflammation or osteitis. Where air cell formation in the petrosa has been extensive, the pathology may simulate that of the diseased mastoid in which pneumatization is usually very marked.

The most common causative micro-organisms associated with petrositis are the streptococcus hemolyticus, staphylococcus or pneumococcus. Of the latter the Type III pneumococcus is especially a prominent offender. The infection may spread to the petrosal cells by the blood stream or lymphatics although lymphatic spread is yet to be definitely proved. Spread by direct extension from an acute otitis media or mastoiditis involving adjacent air cells and passage through their thin walls to other more distal healthy air cells is no doubt the common method of spread. The earliest pathologic change noted is a localized filling of the air cells and osseous interstitial spaces with neutrophiles, serum, some fibrin and a few red cells. The bone cells and calcified tissues soon show evidence of necrosis and softening. The necrotic bone is rapidly absorbed, leaving a localized abscess mass. Often small pieces of necrotic bone may be noted in this mass. As a chronic stage is reached, the abscess may become lined by granulation tissue and it may still later be walled off by fibrous tissue. The abscess material may liquefy, become serous and have a gross appearance similar to that of a cyst.

In those cases of petrositis which terminate fatally there may be noted at autopsy, either frank meningitis, brain abscess formation or dissemination of the infection through the blood stream with multiple pyemic abscess formation, more especially in the lungs. The bacteria first gain entrance to the venous plexus around the cartoid artery draining into the cavernous sinus, superior and inferior petrosal sinuses and finally into the jugular vein which carries the infection to the lungs. Subdural or brain abscess formation and meningitis, of course, result from direct extension of the infection through eroded bony structures or through lymphatic spread.

There is a point which I wish to stress before closing. A varying number of cases diagnosed and treated as mastoid infection have later been found, either clinically or at autopsy, to have had also a rather extensive petrositis.

Clinical Aspects of Petrositis (Dr. R. Hume, Department of Otolaryngology): Petrositis is not a new condition. Troelsch is 1867 gave an excellent description of the clinical entity as we know it today. It is only during the last ten years, however, that it has been discussed under the name of petrositis. Recent studies have been well directed and fruitful, providing valuable information concerning the pathologic changes and anatomic features of and about the petrous pyramid.

American otologists consider this condition merely an extension from the mastoid or middle ear and designate it as a perilabyrinthine extension into the petrous bone. In the mind of the average otologist some confusion was caused by Eagleton's very fine description of osteomyelitis of the petrosal tip, a condition occurring most frequently in children and usually during a course of septicemia. About the same time Kopetzky presented a surgical approach to the petrous tip, which, while highly successful in his hands, appeared extremely difficult and not devoid of danger in the hands of one less skillful. These studies along with observations of others have served somewhat to clarify the mooted points concerning the clinical manifestations noted as the result of petrositis.

The condition occurs during the course of an acute or chronic otitis media or following a simple mastoid operation. If during either of these courses the patient develops an intense retrobulbar pain, more severe at night, with a discharging ear and with or without the presence of sixth nerve paresis, we may suspect that the infection has invaded the petrous pyramid. Those cases in which these symptoms appear early in the course of otitis media require careful examination of the posterior paranasal sinuses as frequently this syndrome is manifested in cases in which the ear infection is merely incidental. If, after a simple mastoidectomy, the discharge continues and these symptoms occur, it is suggestive of extension of the infection through the cells posterior and inferior to the labyrinth. Early inspection and thorough removal of any necrotic areas in this region are often all that is necessary to curb further invasion. When occurring during the course of chronic otitis media or after simple mastoidectomy in which especial attention has been directed to the cells of the inner antra wall, the simple mastoid wound should be converted into a radical one and careful inspection of the pathways anterior, posterior and inferior to the labyrinth should be inspected for possible fistulous tracts. If one of these is found it should be followed until the area of necrosis has been entirely removed. If none is present, the

wound should be dressed openly and further operative procedure discontinued, as often the symptoms may be effected by the intense congestion produced by the infected membranes of the middle ear on the venous supply of the petrous pyramid.

There are a certain number of cases in which no symptoms are present and extensive involvement of the petrosa is found at autopsy, the terminal stage of meningitis having occurred without the presence of the usual symptoms. In the fatal cases, death is produced by extension of the infection by way of the vascular supply or fistulous tracts to the meninges. A series of cases were then reported.

Roentgenology of Petrositis (Dr. L. J. Menville, Department of Radiology): While we appreciate the important role which the roentgen ray plays in the diagnosis of sinus and mastoid infections, we cannot say that it has the same accuracy in the diagnosis of petrositis. The inaccessibility of the petrous pyramid makes its roentgenography difficult. This is partly due to the fact that most of the petrous pyramid lies rather deep in the skull, and it is almost impossible to obtain a clear picture of its entirety without superimposition of the shadows of the sinuses, rim of the orbit, or tissues of the neck.

The most common type of petrosa is pneumatized only in a few areas. The surrounding bone is more or less densely trabeculated bone containing marrow. The shadow of this sclerotic or diploic bone, as the case may be, is superimposed on the few pneumatic cells, and, if they are small or located in certain areas, their shadows may be obliterated completely.

In interpreting roentgen ray films of a case of petrositis, we try to estimate the degree of pneumatization of the diseased side before the disease takes place. This can be done by comparing the diseased area with a film previously taken when disease did not exist. This, however, is not a very practical procedure.

In early cases of petrositis, we find on the affected side a slight increase in density due to an obliteration of the cell walls by containing fluid or granulation tissue. In the advanced cases, we find a decreased density due to a breaking down of the cell walls. If the petrous tip is not pneumatized, the above changes do not ensue. This is of importance to the clinician for in a diploic type, frank suppuration does not take place. It is a common procedure to compare the diseased petrosa on one side with the normal petrosa on the opposite side. It is sometimes difficult to make a diagnosis by comparing the two sides. If there is a history of previous otitis, and, especially if this otitis was present in infancy, variations in the pneumatized area are to be expected, resulting in an erroneous conclusion. I wish to emphasize that if there are roentgen changes in the petrosa, and there are no associated clinical symptoms pointing to petrous suppuration, a positive diagnosis from the roentgen ray alone should not be taken too seriously.

Due to the difficulty of visualizing the petrous pyramid clearly by means of the roentgen ray, many different technics have been employed. I shall present for your consideration a few of the most popular ones. Some roentgen ray films were then demonstrated.

GRADUATE SCHOOL
LOUISIANA STATE UNIVERSITY
MEDICAL CENTER

NEW ORLEANS

The scientific meeting of February, 1937, was called by Doctor J. T. Nix, Director of the Graduate School. Doctor Manuel Garcia presented the following paper:

LIPOSARCOMA WITH CASE REPORTS

Malignant tumors of fatty tissue occur rarely. Only two persons thus afflicted have been seen at the Tumor Clinic, where, over a period of three years, more than nine hundred patients have come for observation and treatment for neoplasms of all types. Studies on the subject are sparsely scattered in the literature. Hence we believe the report of our cases may be of interest.

Case 1. J. B., a white farmer 76 years old, was seen November 23, 1933 with an ulcerated nodular, suppurating mass about 6 cm. in diameter, situated just below and in front of the left ear. It was very tender, red and immovable. Pain had been present for two months and the patient had been bleeding intermittently for a month. The patient's general health had been poor and his mentality was clouded. There was no indication of metastatic activity and no intra-oral or facial lesions were present. Biopsy was refused for several weeks during which roentgen ray therapy was administered with a total dose of 1600 roentgens. When permission for biopsy was granted a liposarcoma was found. Surgery was recommended but was rejected and 1800 mg. hrs. of radium were given interstitially on January 8 and 11, 1934. The lesion regressed and remained inactive for months but in May of that year he developed pneumonia and died on May 29, 1934.

Case 2. Mrs. R. S., a while female, 56 years old, reported January 17, 1935 with a large mass fully 20 cm. in diameter on the right side of the neck below and behind the ear. In June 1934 a lump in the back of the ear had started to grow rapidly and it had been ulcerated for two months. In December, 1934 considerable bleeding had followed the application of a caustic paste. The mass was tender, soft, pedunculated and had an ulcerated necrotic dome. No cervical or pulmonary

metastases were evident. Biopsy showed liposarcoma with infection. On February 8, 1935 the tumor was excised and a week later the ear and a wide area of skin and subcutaneous structures in the neighborhood of the tumor, and their base thoroughly cauterized. From February 15 to March 12, 1935, 2000 roentgens were given to the ulceration that remained. In June of the same year 1600 additional roentgens were given to the same region. The ulcer healed completely in June, 1936. A right facial paralysis is present but the patient has remained well to the present time, just short of two years after operation, and the malignancy appears to have been extirpated.

Liposarcoma may occur at any age but greatest incidence falls between the ages of forty and sixty (Seids and McGinnis); they are said to affect females more commonly. Their malignancy is variable and while metastasis to the lung does occur, commonly their gravest features are ulceration, leading to hemorrhage and sepsis, and local recurrence after excision. Ewing describes individuals in whom the tumor has spread widely. Stout believes that the retroperitoneal tissues are the commonest site of involvement, but the seats for election for lipoma are equally favored by liposarcoma; these include the subcutaneous tissues, especially in the neck, the mediastinum or the omentum. Geschikter, in a careful study of twelve cases, found that four had developed in recurring fibrous and embryonic lipomas and that eight were primary. The sites of involvement included the lower extremity (five), the breast (three), the arm (two), and the back and thorax (one each). All but two of the patients were over fifty years of age. In each case recurrence took place and none was reported cured, but the average duration of the disease from the first symptom to the appearance of metastases was ten years.

Geschikter describes the histologic structure of the tumors as resembling fascial sarcoma, with compact spindle cells, sometimes interspersed with large giant cells that have degenerating nuclei and large pale foamy cytoplasm. Areas of embryonic and adult fatty tissue and a myxomatoid stroma are also found. Ewing states that they usually contain enough fat to be recognizable as lipomatous tumors but sometimes only traces of fat are present and the component cells give no clue as to their source. Because cellular, apparently encapsulated growths have a tendency to metastasize and to recur locally, Ewing advises painstaking extirpation of lipomas in which many cells contain scant amount of fat. In the gross, sarcomas are usually distinguishable from simple lipomas by their lesser mobility consequent to the infiltration of adjacent structures. The growths are soft, semifluctant masses, usually quite painless, but in the cases seen by us ulceration and secondary infection had made them painful and tender. Microscopically these two cases were very similar, being composed of very large oval, rounded and polyhedral cells with large nuclei. Mitotic figures were frequent and an abundant inflammatory exudate was present.

The genesis of liposarcoma is obscure. Seids and McGinnis believe they are either a sequel to trauma or a malignant stage of simple lipoma. The relationship to simple lipomas is intimate although in clinical experience lipomas rarely undergo malignant degeneration. There are no instances on record of inheritance in successive generations of a family as occurs with lipomas sometimes, and multiple primary liposarcomas are unknown. No connection to the peripheral nerves has been found, as is the case in fibroma, but a congenital tissue predisposition seems to be an essential factor. "It has been shown by Kolliker and Toldt that the fat lobules have a certain independence in development which constitute them a sort of primitive organ. The comparative isolation of the blood supply of these lobules reappearing in lipomas suggests that the anomaly predisposing to lipoma is connected with the distribution of blood vessels in the fatty tissues." (Ewing). A definite embryonic disturbance is associated with the lipomas of the kidney, where misplaced islands of capsular fat are said to give rise to the tumors. Other instances are seen in spina bifida, and intracranial growths. Ewing points out that hypertrophy of fat may occur in many forms, the causes of which he lists as follows: (1) obesity; (2) localized overgrowth of fat tissue, as in lipoma annulare colli; (3) replacement lipomatosis, as occurs in atrophic organs, such as the thyroid, the thymus, bone marrow, kidney, capsular lipoma (Virchow), and lymph nodes; (4) homologous lipoma, which includes the majority of the solitary subcutaneous lipomas; (5) heterologous lipoma from misplaced groups of embryonal tissue cells; (6) overgrowth of lipoma in mixed tumors and teratomas. The complex relations of these tumors is seen especially in the liposarcomas of the kidney, where admixture of muscle elements and areas of xanthomatous change have been found. In one instance adrenal tissue was found, and for this reason Ewing believes that they may be connected in some way with struma suprarenalis of Grawitz.

Geschikter has pointed out that "the location and age of onset of the tumor process in benign and malignant lipomas indicate that developmental processes play a dominant role. These developmental processes are influenced by the genetic pattern of tissue development and by the hormonal control of endocrine glands." Tumors of the lipoid group tend to follow in anatomic distribution specialized lipoid structures present in embryonic life. One of these is located between the shoulders, is derived from the lymphatic sacs near

the jugular veins, is composed of vascular lymphoid tissue and contains many fat cells. It is said to correspond to the hibernating glands of insectivora and bats and has been termed the interscapular gland. Lipomatous tumors also apparently follow the same distribution as lymphatic cysts derived from the lymphatic sacs of the embryo, which correspond to the lymph hearts of the amphibia. It is of interest that both lymphoid tissue and lipomatous tissue develop late in the course of evolution and also late in embryonic life. "The hormonal influence which controls the further development of fat in later life is probably variable and derived from more than one source. Cushing demonstrated basophilic adenoma in the anterior pituitary lobe in Dercum's syndrome (adiposis dolorosa) . . . Basophilic hyperplasia of the hypophysis is well known during gestation. Lipomatous tumors also occur in Frohlich's syndrome, in which lesions at the base of the hypophysis have been described." The appearance of tumors after puberty suggests that the sex glands may have an influence on their inception. Geschikter was able to produce xantholipomatous proliferations of fat in the subcutaneous tissues of the monkey by injections of chorionic gonadotropic hormone.

According to Stout there are no reliable criteria on which to base a prognosis in liposarcoma. Since in all connective tissue tumors available methods of irradiation have proved ineffective, Quick and Cutler recommend radical surgery. Preoperative irradiation is said to be helpful in obviating rapid reappearance in the more malignant types. "In inoperable tumors, heavy external radiation alone or combined with interstitial radiation may succeed in arresting the disease and relieving pain and occasionally result in disappearance of the neoplasm over a period of years (Stout)." Coley's toxins may be helpful but we have had no experience with them.

SUMMARY

Two cases of liposarcoma are reported and the clinical and histological characteristics of the growth are discussed. Although etiology remains obscure, aberrations of the development of embryologic lymphatic and lipomatous organs seem essential for their inception. Hormonal influences, especially of the anterior pituitary and the gonads may be determining factors in their activity. The growths usually advance slowly but have a strong tendency to local recurrence after excision and eventually metastasize. Treatment should consist of wide, thorough extirpation, preceded and followed by radiation if the growth is very cellular.

REFERENCES

Ewing, James: Neoplastic Diseases.
Stout, A. P.: Human Cancer.
Geschikter, C. S.: Am. J. Cancer, 21:17, 1934.
Seids, J. V. and McGinnis, R. S.: Surg. Gynec. Obst., 44:232, 1927.
Quick, D. and Cutler, M.: Ann. Surg., 86:810, 1927.

BAPTIST HOSPITAL

The regular monthly meeting of the Staff of the Baptist Hospital was held Tuesday night, January 26, 1937, in the Assembly Room at the Hospital.

Dr. Maurice Lescale read a paper on Hemorrhoids, which was very thorough and very interesting, and which was discussed by the doctors.

Dr. Lescale presented the etiology of hemorrhoids and especial emphasis was given to anatomic and inflammatory factors.

Classification (anatomic) into external and internal hemorrhoids was further subdivided according to development into three stages: the symptomatology, pathology, and treatment of each was given along with mention of complications and their treatment.

It was recommended that the use of the injection treatment be reserved for only first and some second stage piles. Surgery was recommended for most second stage and all third stage cases.

Dr. Wilkes Knolle, Chairman of the Executive Committee, read his report from that committee for the year 1936.

Election of Officers for the coming year was next held: Dr. E. McC. Connely was elected Chairman; Dr. H. B. Alsobrook, Vice-Chairman; Dr. K. Kelly Stone, Secretary; and Dr. W. R. Hardy re-elected Treasurer.

At this time the Death Report for the month of January, 1937, was read and Dr. W. D. Phillips brought out the interesting factor in his case of pulmonary embolism. This was discussed by the various doctors present.

H. C. Magee, M. D., Sec.

MERCY HOSPITAL

It was deemed advisable to dispense with any scientific essays at this meeting because of the amount of business to come before the staff and also because of the scientific aspects of the mortality investigation.

Several interesting cases were presented and the following is only a brief summary of two of the cases:

Case No. 1. This case was one of amebiasis with amebic liver abscess. The patient was a young white male, 22 years old, who had been having vague pains for about three weeks and always worse in epigastrium. Recently there had been considerable chills and nausea following ingestion of any food whatsoever. Appetite was very poor and a papular rash had appeared over chest and

abdomen; considerable wasting away during recent illness but no history of diarrhea. Clinically the case resembled somewhat that of a typhoid or dysentery infection but all agglutinations proved negative.

Only about four days after admission was blood found in stools and the liver began to enlarge below costal margin. Entameba histolytica cysts and trophozoites were finally found and despite care given, the patient gradually went down hill and died.

Especially interesting concerning this case was the fact that roentgen ray failed to show any elevation of diaphragm and that the abscess had ruptured into peritoneal cavity rather than above.

Autopsy findings revealed a large liver abscess involving the whole inferior, middle and posterior aspects of liver. Abscess had ruptured into peritoneal cavity and much blood and pus in cavity. Typical amebic abscess in gastrointestinal tract.

Case 2. This case was one of an aged man, 70 years old, who had been compaining of pain in abdomen and left leg and ran a high, persistent fever. Final diagnosis was malignant endocarditis, bacteremia, chronic nephritis and generalized arteriosclerosis.

The patient had been having high fever for several weeks, and only four days prior to admission had generalized abdominal pain and pain in left knee which probably was part of bacteremia.

On admission there was a fever of 102.5°, pulse 116 and respiration 28 and had appearance of one quite ill, weak, and extremely listless. Heart was quite irregular, abdomen distended, voided involuntarily and hematuria noted. The leukocytic count reached 21,250 with 89 per cent polynuclears. Blood culture revealed hemolytic streptococcic infection. Patient's fever ranged from 99-104°F. throughout. He died on seventh day after admission.

After discussion of the remaining mortalities, the Staff went into Executive session.

H. Ashton Thomas, M. D., Sec.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

MARCH 1, Board of Directors, Orleans Parish Medical Society, 8 p. m.

MARCH 1. Pathologic Conference, Hotel Dieu, 8 p. m.

MARCH 2. Eye, Ear, Nose and Throat Hospital Staff, 8 p. m.

MARCH 3. Clinicopathologic Conference, Touro Infirmary, 11:15 a. m. to 12:15 p. m.

MARCH 3. Mercy Hospital Staff, 8 p. m.

MARCH 3. Board of Governors, 1st and 2nd District Dental Society, 8 p. m.

MARCH 8. New Orleans Graduate Medical Assembly. Registration 8 a. m. General Sessions 9:30 to 11:30 a. m.

MARCH 8. ORLEANS PARISH MEDICAL SOCIETY (meeting dispensed with because of Assembly).

MARCH 9. New Orleans Graduate Medical Assembly.

MARCH 9. Charity Hospital Dental Staff, 8 p. m.

MARCH 10. New Orleans Graduate Medical Assembly.

MARCH 10. Touro Infirmary Staff, 8 p. m.

MARCH 11. New Orleans Graduate Medical Assembly.

MARCH 12. French Hospital Staff, 8 p. m.

MARCH 15. Hotel Dieu Staff, 8 p. m.

MARCH 16. Charity Hospital Medical Staff, 8 p. m.

MARCH 17. Clinicopathologic Conference, Touro Infirmary, 11:15 a. m. to 12:15 p. m.

MARCH 17. Charity Hospital Surgical Staff, 8 p. m.

MARCH 18. 1st and 2nd District Dental Society, 8 p. m.

MARCH 19. Eye, Ear, Nose and Throat Club, 8 p. m.

MARCH 20. I. C. R. R. Hospital Staff, 12 noon.

MARCH 22. ORLEANS PARISH MEDICAL SOCIETY, 8 p. m.

During the month of February, the Society held one regular scientific meeting. The meeting of February 8 was dispensed with because of confliction with Carnival. The following program was presented at the meeting of February 22:

Lymphogranuloma Inguinale.
By: ..... Dr. James Wm. Tedder.
Discussed by Dr. E. von Haam.

Diseases of the Nervous System from Nutritional Deficiency.
By: ..... Dr. Erwin Wexberg.
Discussed by Drs. C. S. Holbrook and L. L. Cazenavette.

Dr. Nix appointed committees for 1937 during the past month, and as soon as all acceptances are received they will be published.

Dr. George S. Bel, Director of Charity Hospital, has announced the following changes in the several staffs.

Dr. Alton Ochsner, Dr. C. Walter Mattingly and Dr. H. B. Alsobrook were appointed Senior Visiting Surgeons. Other appointments, in the nature of promotions were: Drs. Edward H. Maurer, I. W. Kap-

lan, W. Robyn Hardy, and John E. Lindner, Visiting Surgeons; Drs. C. P. Cabibi and W. H. Roeling, Visiting Obstetricians; Drs. H. W. Kostmayer and P. T. Talbot, members of the Consulting Staff; Dr. W. A. Sodeman, Visiting Physician; and Dr. A. E. Fossier, Consultant in Medicine.

The new appointments included: Drs. Carroll F. Gelbke and C. V. Perrier, Visiting Surgeons; Drs. John G. Menville, P. E. Prouet, John F. Oakley, W. H. Meade, Robert Major, and Michael E. DeBakey, Assistant Visiting Surgeons; Dr. L. A. Golden, Assistant Physician; Drs . George Dechard, Jr., Grace Arabell Goldsmith, T. A. Watters, R. H. Bayley, and Ray L. Gregory, Assistant Visiting Physicians; and Dr. Joseph Ziskind, Assistant Visiting Pathologist.

Drs. Rigney D'Aunoy, Arthur Vidrine, C. C. Bass, and John H. Musser attended at Chicago, February 15, 16 the Thirty-Third Annual Congress on Medical Education and Licensure.

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

The Southern Section of the Society will meet in the Richardson Memorial Building of Tulane University, March 5 at 8:15 p. m. A series of eight papers, of 10 minutes duration each, will be presented by the following: E. von Haam and R. Hartwell (2); J. C. Swartzwelder; B. I. Burns, J. D. Reese and A. G. Sellmann; H. M. Sweeney and H. S. Mayerson; W. A Sodeman, G. E. Burch and R. H. Turner; G. E. Burch and W. A. Sodeman; M. Bodansky and W. R. Cooke.

In response to the numerous telephone calls, the members of the Orleans Parish Medical Society are hereby notified that no Occupational Tax has been levied on practitioners of medicine for the past two years by either the State of Louisiana or the City of New Orleans.

Drs. N. K. Edrington and Earl A. Hogan were elected to Active Membership.

Dr. John M. Miles has transferred his membership to Greenbay, Wisconsin.

Dr. Roy H. Turner addressed the Medical History Society of Tulane University Medical School on "Gadgetry," at their meeting held on Friday, January 22. Dr. Alton Ochsner will present a paper on "Christian Fenger" at the next meeting of the Society, February 5, and Dr. A. E. Fossier will speak on "New Orleans Medicine" when the group meets on February 19.

Dr. Maud Loeber was elected on January 25, to the Presidency of the Metropolitan Board of the New Orleans Diocesan Council of Catholic Women, an organization which has as its aim the sponsoring of the newly formed study clubs, parent-teacher associations, the Confraternity of Christian Doctrine, and the Catholic Youth organizations for girls.

Dr. C. C. Bass attended the meeting of the Committee on Scientific Research of the American Medical Association, which was held in Chicago on January 31.

The meeting of the Southern Interurban Clinical Club, held on January 29 and 30, in Atlanta, Georgia, was attended by the following local members: Drs. John H. Musser, J. T. Halsey, Randolph Lyons, I. I. Lemann, C. L. Eshleman, Chaille Jamison, P. H. Jones, and Roy Turner.

At the annual meeting of the physicians and surgeons comprising the visiting staff of Charity Hospital, Dr. W. A. Love was elected President of the Staff; Dr. Frederick L. Fenno, Vice-President; Dr. Frank Chetta, re-elected Secretary; and Dr. Oscar Bethea and Dr. I. M. Gage were elected to the Board.

Dr. Ansel Caine attended the meeting of the Anesthetists Travel Club, January 3 to 8, 1937, at Los Angeles and San Francisco.

A meeting of the Touro Staff was held on Wednesday, February 3, at which the following officers were elected: Dr. L. R. DeBuys, Chairman, Dr. C. S. Holbrook, Vice-Chairman, and Dr. James D. Rives, Secretary.

TREASURER'S REPORT

ACTUAL BOOK BALANCE: 12/30/36:	$1,784.43
January Credits:	$2,046.44
TOTAL CREDITS:	$3,830.87
January Expenditures:	$1,194.83
ACTUAL BOOK BALANCE: 1/30/37:	$2,636.04

LIBRARIAN'S REPORT

The Library has loaned to doctors 664 books and journals during January, or more than one to each member of the Society. In addition 876 items have been loaned to students for overnight use, making a total of 1,540. These figures do not include the great use of books and journals within the Reading Rooms.

During January, 81 volumes have been added to the Library. Of these 14 were received by gift, 7 from the New Orleans Medical and Surgical Journal, 57 by binding and 3 by purchase. Notation of new titles of recent date is given below.

On request of physicians, members of the staff have collected material on the following subjects during the month:

Snapping fingers.

Polycythemia vera.

Seborrhea in relation to the eye.

Curriculum in post-graduate medicine.

Therapeutic use of sandalwood oil.

Urinary antiseptics.

Reaction of naphthalene on nervous system.

Splenic extract in treatment of non-union of fractures.

Granulosa cell tumors of the ovary.

Mortality from surgery of prostate.

Presacral neurectomy.

Fetal and neonatal mortality.

NEW BOOKS

Schumann, E. A.—Textbook of Obstetrics, 1936.

Bortz, E. L.—Diabetic Manual, 1936.

Carter, C. F.—Microbiology and Pathology for Nurses, 1936.

Keyes, E. L.—Urology, 1936.

Association of Life Insurance Presidents—Proceedings, 1936.

Surgeon-General of U. S. Army—Annual Report, 1936.

Surgeon-General of U. S. Public Health Service—Annual Report, 1936.

Surgeon-General of U. S. Navy—Annual Report, 1936.

Connecticut State Medical Society—Transactions, 1936.

American Surgical Association—Transactions, 1936.

New Jersey—Health Department—Health Review for City of Newark, 1930-35, 1937.

Wellcome Historical Medical Museum—Lister Collection, 1937.

Haller, Albrecht von—Dissertation on the Sensible and Irritable Parts of Animals, 1936.

Huddleson, I. F.—Brucella Infection in Animals and Man, 1934.

Pardo-Castello, V.—Diseases of the Nails, 1936.

Gilbert C. Anderson, M. D., Sec.

LOUISIANA STATE MEDICAL SOCIETY NEWS

THE MONROE MEETING

Members of The Louisiana State Medical Society: The various committees of the Ouachita Parish Medical Society are very active in working out the details for the annual meeting of the Louisiana State Medical Society in Monroe, April 26-28, 1937.

Plans are under way for "A Big Meeting". You are assured of entertainment in many ways. Hotel accommodations are ample, as Monroe has several first class hotels. Arrange now to be with us.

A current belief in this section that will one day become a tradition, is that anyone who has once tasted of Monroe's famous barbecued meats and drunk a little of its river water, is forever after afflicted with a nostalgia to return.

Perhaps that is one of the reasons why Monroe, Louisiana, in the heart of one of the world's greatest gas fields, bears the distinction of being chosen by group after group, year after year, as the best place in north Louisiana to hold a convention. Her citizens however, feel that the reasons are much more far-reaching than that.

In the first place, its strategic situation on the east bank of the Ouachita River at a converging point of rail, water, highway and air transportation, makes it easy of access from all sections of Louisiana. The main lines of the Missouri-Pacific and Illinois Central railroads serve it from north to south and from east to west. U. S. 80, a paved thoroughfare from the Atlantic to the Pacific coasts crosses Monroe, as does U. S. 165 from the Canadian border to the Gulf of Mexico. Excellent air transportation is afforded in all directions, and for those to whom time matters little, year round navigation on the beautiful Ouachita River and its tributaries is possible.

Two excellent golf courses, a splendid municipal swimming pool, parks, moving picture theaters, and industrial plants peculiar to the section are other advantages that this thriving little city has to offer in the way of amusement and entertainment for visitors as well as for home folks.

Monroe is unusually fortunate in the number of its modern, up-to-date hotels, equipped to take care of hundreds of guests, and five auditoriums, ranging in size from little E's to Basses, are available for large and small gatherings.

A congenial atmosphere can be found for any life that the individual may choose, for a few days, or for keeps. There are groups devoted to religious activities, music, garden, and literary clubs, a good public library, Little Theater organization, labor unions, civic clubs, two splendid school systems, and a branch of Louisiana State University which offers two years of college work.

Although a well-defined progressive spirit is manifested in the paved streets of the town, excellent shopping facilities and other "city" advantages, there is a delightful easy going tendency on the part of the people to take life fairly briskly, but without bustle. A custom that still prevails, is for acquaintances, even fairly casual ones, upon meeting downtown, to adjourn to the nearest coffee shop for a cup of the delicious brew, and to chat over the happenings of the day. Gentlemen on streetcars and buses in Monroe never let a lady stand, and the courtesy, broadmindedness and hospitality of the people are bywords among those who have visited here.

Such an atmosphere is the outgrowth of the rich

and interesting historic background that the city boasts.

The oldest town of north Louisiana, and one of the first settlements in the entire state, it was first known as Ouachita Post, taking its name from an extinct Indian tribe that disappeared long before any permanent settlement was made. The earliest settlers were chasseurs and couriers de bois, who in all probability penetrated the section after LaSalle and Tonti in 1682 sailed the mighty Mississippi from Canada to its mouth, and before the famous Natchez massacre. Even before that time, many historians are agreed that De Soto in all probability, passed down the Ouachita River by the present site of Monroe in 1542, a short time before his death near what is now Ferriday, Louisiana. Tradition as well as history gives credence to this belief. An old negro resident of Monroe is fond of telling how he had it from his grandpappy, who in turn was told by his grandpappy's pappy, "Dat de Injuns used to tell 'bout de time when 'Soto passed down de Ouachita."

The real beginning of the town however, occurred in 1783, when Don Juan Filhiol, a Frenchman in the service of the King of Spain, was commissioned by Don Estevan Miro as commandant of the Ouachita Post. With his wife, the beautiful Francoise Poiret of Opelousas, the intrepid Don established himself permanently at Ouachita Post, and a few years later, after a stockade had been constructed as a protection to the settlers from unfriendly Indians, the name of the post was changed to Fort Miro, in honor of Estevan Miro, governor general of the province of Louisiana.

The little settlement grew slowly, and in 1819, when the first steamboat, the James Monroe, chugged up the Ouachita from New Orleans, the name of the village was changed to "Monroe" in honor of the boat, and in commemoration of the memorable event.

Many steamboats followed the James Monroe, and cotton, which had become the principal crop in the section, became a highly profitable one. Growth was steady and sure, and while there were no great booms, there was scarcely a setback except that due to the Civil War.

It was not until 1916 however, that the event occurred which was to make Monroe both a metropolitan and an industrial center. This was the discovery of natural gas in the area. The extraordinarily rapid growth of a population of 5428 in 1900 to 26,028 at the time of the 1930 census, was largely due to the influx of industries such as carbon black plants and paper mills, which were attracted to the section by the cheap fuel adjacent to inexpensive labor and excellent transportation facilities.

In keeping with the march of time, the city of Monroe owns and operates its public utilities, supports a modern airport, splendid sanatoriums, a radio station, and public and private business enterprises of all kinds, all of which justify its standing as the fourth city of the State of Louisiana.

It is asking a great deal of human imagination to bridge the lapse of time from Monroe of the past to scenes of the present day; to realize that the white ribbons of concrete on her streets and highways were once Indian trails; that only the pad of swift red feet fell, and slow moving wagons and buggies were seen, where now, automobiles of every description rush back and forth; that acre after acre of cultivated lands was once dense forests; that hunting and trapping constituted the major part of the active trade now in evidence—it is not easy to believe—but it is true!

Arrange now to come to the Monroe Meeting. We welcome each of you. Do not forget to bring the wife.

We await you.

Courtland P. Gray, M. D.,
Chairman, Publicity Committee.

SHREVEPORT MEDICAL SOCIETY

The regular meeting of the Shreveport Medical Society was called to order by the President on February 2, 1937, with 41 members and four guests present. Minutes of the previous meeting were read and adopted.

Committee Reports: Resolutions upon the deaths of the fathers of Dr. B. C. and George Garrett and of Dr. Boone were read and the Society ordered that they be adopted and copies sent to the families.

Dr. George Wolfe, Chairman of the Program Committee, outlined the purpose of his questionnaire and urged cooperation of the members in aiding the Committee in furnishing good programs for the Society.

Dr. Lucas, Chairman of the Entertainment Committee, made a motion that the Secretary be instructed to write to Sheriff Hughes, thanking him for the courtesy extended the Society at our last meeting. Motion duly carried.

The Chairman then named members appointed to the Emergency Medical Relief Committee and Dr. J. M. Gorton, General Chairman, outlined the purpose of this Committee.

Scientific Program: Dr. Paul D. Abramson presented his experience with certain diagnostic measures in the study of Peripheral Vascular Diseases. His paper was discussed by Drs. Hargrove, Herold, Caldwell, Blandino, W. S. Kerlin.

Dr. Paul Winder outlined the modern method of treating vesicovaginal fistula, outlining important points in the preoperative, operative and post-

operative care of these cases. He presented a case history of a typical instance.

Dr. S. C. Barrow presented some interesting roentgen ray plates, showing what was apparently a diverticulum of the cecum with the appendix arising from this diverticulum.

Unfinished Business: The Committee reported favorably on the application of Dr. Wilson. The Society then elected him to membership.

New Business: Dr. J. A. Hendrick made a motion that money segregated in the Permanent Home Fund be invested in Building and Loan stock at the discretion of the Permanent Home Committee. This motion was duly seconded and carried.

Dr. Barrow made a motion that the Shreveport Medical Society contribute $100.00 from its general fund to the Red Cross for flood relief. This motion was duly seconded and carried.

Dr. J. M. Gorton offered a suggestion that the Memorial Committee be instructed, in the future, to draw up appropriate resolutions, sending them immediately to the families and simply reading them as a report of activities at the following meeting of the Society.

Applications for membership in the Society were received from Dr. H. T. Best, Dr. Dave Kaminsky, Dr. J. S. Shavin and Dr. T. A. Hendrick. The applications, being found in proper order, were ordered to take the usual course.

Dr. Caldwell called attention to the fact that the Caddo Unit of the Louisiana Crippled Children's Society was planning to hold diagnostic clinics in neighboring small communities and urged cooperation of the medical profession.

Paul D. Abramson, M. D., Sec.

EAST AND WEST FELICIANA BI-PARISH MEDICAL SOCIETY

A meeting of the Society was held in the staff room of the East Louisiana State Hospital at Jackson on February 3, 1937, presided over by Dr. S. L. Shaw, president. The session consisted of a supper followed by an excellent scientific program. The following scientific papers were presented: "Heart Disease in Pregnancy", by Dr. Guy Riche of Baton Rouge, "Stone Formation in the Urinary Tract" (with roentgen ray illustrations), by Dr. Edgar Burns of New Orleans, and "Artificial Therapy in Paresis or Neurosyphilis", by Dr. Guy Odom of Jackson. These papers were freely and favorably discussed by the members, and a vote of thanks was given to the speakers for their presentation. Drs. Riche, Burns and Odom were made honorary members of the Society.

E. M. Toler, M. D., Sec.

LAFOURCHE VALLEY MEDICAL SOCIETY

The Lafourche Valley Medical Society met February 10 at Thibodaux. The scientific program consisted of two papers, the first by Dr. John Menville of New Orleans entitled "Treatment of Infection of the Lower Urinary Tract." The second paper on the program was read by Dr. Percy LeBlanc of Donaldsonville and was entitled "Bacteriophage as a Therapeutic Agent." The Society served a delicious banquet following the meeting which was very much appreciated.

NEWS ITEMS

Dr. Oscar W. Bethea addressed the medical society in Beaumont, Texas, on February 8, discussing "Physical Diagnosis."

Dr. A. L. Levin gave a lantern slide lecture on "Gall-Bladder Disease" at the meeting of the Seventh District Medical Society in Welsh, Louisiana, on January 21, 1937.

P. Blakiston's Son and Company, Incorporated, announce with deep regret the death of the president, Kenneth M. Blakiston, on Tuesday, January 19, 1937.

The J. B. Lippincott Company announces the sudden death of William A .Widmer, for thirty-seven years with this publishing firm.

Passed Assistant Surgeon Roy E. Butler has been relieved from duty, U. S. Quarantine Station, New Orleans (Algiers) La., upon arrival of Assistant Surgeon Theo. L. Perrin; to proceed to Mobile, Ala., for assignment to quarantine duty.

Assistant Surgeon Theo. L. Perrin has been relieved from duty, U. S. Quarantine Station, Gallops Island, Boston, Mass., and ordered to the U. S. Quarantine Station, New Orleans, (Algiers) La., for duty.

Dr. Gabriel Steiner, former professor of psychiatry at Heidelberg University, Germany, has become affiliated with the Department of Pathology and Bacteriology of the Louisiana State University Medical School.

A southern sectional meeting of the American College of Surgeons was held in Atlanta, Georgia, on February 3, 4 and 5, with extensive clinics, papers, movies and operations. Drs. Thomas B. Sellers, Jas. T. Nix, Alton Ochsner and A. J. Hockett of New Orleans attended. Dr. William B. Clark, also of New Orleans, participated in the program of the Eye, Ear, Nose and Throat Section by invitation.

FIFTH DISTRICT MEDICAL SOCIETY OFFICERS, 1937

President—Dr. C. P. Gray, Jr., Monroe.

Vice-President—Dr. Ralph King, Winnsboro.
Secretary-Treasurer—Dr. R. M. Simonton, Monroe.
Delegate—Dr. Marvin Green, Ruston.
Alternate—Dr. B. Spencer, Sterlington.

TUBERCULOSIS AND PUBLIC HEALTH ASSOCIATION OF LOUISIANA

The Annual Meeting of this organization was held in the morning, January 27, 1937, at the Roosevelt Hotel. Following the business meeting, there was a luncheon at which Dr. William H. Perkins presided. Dr. Sydney Jacobs spoke on "The Present Outlook for the Tuberculous Patient."

At the afternoon session Dr. Joseph A. Danna presided, and the first event of the session was a Round Table Discussion on "Tuberculosis Clinics, Their Importance and How to Secure Them." Dr. John Signorelli, in leading this discussion, pointed out the necessity of there being adequate care for the tuberculous patient throughout the state, the necessity of recognizing early cases and above all the thorough and complete examination of contacts. Dr. J. M. Batchelor, who followed, showed that this was a problem of such magnitude that, in truth, it could be handled only by state funds supplemented by local contributions. Drs. A. J. Hockett and J. H. Musser spoke to much the same effect; that a more expensive program might be omitted for the present, and a start made by introducing clinics for the introduction of pneumothorax, which, it has been found, would rapidly make an open case a closed case. Dr. I. L. Robbins conducted a splendid Roentgen Ray Clinic as the last of the program.

At the business meeting, Dr. W. H. Seemann of New Orleans was re-elected president of the Association and Dr. W. H. Perkins was elected first vice-president to succeed Dr. H. E. Bernadas who resigned. The other officers were re-elected for a second term. The new members selected to serve on the Executive Committee were Miss Emma Maurin, Jess Heir, Dr. Sydney Jacobs, Dr. A. J. Hockett and Dr. I. L. Robbins.

INFECTIOUS DISEASES IN LOUISIANA

Dr. J. A. O'Hara, Epidemiologist for the State of Louisiana, has furnished us with the weekly morbidity reports for the State of Louisiana, which contain the following summarized information: For the week ending January 16, there was a very large number of influenza cases reported, 283 in all. The incidence of measles jumped from 7 cases, in the previous week, to 122 this week. Other diseases reported in double figures were as follows: 69 cases of pulmonary tuberculosis, 67 of pneumonia, 31 of syphilis, 21 of gonorrhea, 14 of whooping cough and 11 of diphtheria. The incidence of diphtheria showed a surprisingly gratifying reduction, the number of cases reported being only about one-third the five year average. Of the unusual cases, Caddo Parish reported 1 of smallpox and Orleans 1 of poliomyelitis. For the week ending January 23, there was some reduction in the incidence of influenza, 193 cases being listed. Pneumonia dropped to 52 cases. There were 27 cases each of diphtheria, gonorrhea and pulmonary tuberculosis, 23 of syphilis and 13 of chickenpox. A case of poliomyelitis was reported from Orleans Parish and one from Richland Parish. Four cases of spinal meningitis were listed from Orleans Parish and 1 from Acadia. The influenza epidemic showed an increase in the number of cases that came to the Bureau of Epidemiology during the week ending January 30, there being 235 such cases. Other double figure diseases included 48 cases of pneumonia, 40 of syphilis, 38 of gonorrhea, 14 of cancer and 13 of pulmonary tuberculosis. Another case of poliomyelitis appeared this week, this time in Bienville Parish. Influenza was still rampant, the week of February 6, with 291 cases listed. The following diseases, in order of frequency, were likewise listed: 45 cases of pneumonia, 30 of syphilis, 23 of pulmonary tuberculosis, 19 of gonorrhea, 18 of cancer, and 14 of diphtheria. There was some drop in the incidence of influenza during the week of February 13, 228 cases being listed. Other frequently reported diseases included 54 cases of syphilis, 35 of pulmonary tuberculosis, 34 of pneumonia, 28 of whooping cough, 15 of cancer, 12 of gonorrhea and 10 of scarlet fever.

HEALTH OF NEW ORLEANS

The Department of Commerce, Bureau of Census, reports that for the week ending January 16, 1937, there were 164 deaths in the city of New Orleans, divided 90 white and 74 negro. In the same week, there were 10 deaths under one year of age, divided equally between the two races. For the week ending January 23, there were 2 less deaths than for the previous week, five more in the white race and 7 less in the colored population. The infant mortality showed 16 deaths in children, of which 10 were white and 6 negro. For the week ending January 30, the deaths were 178 in number, of which 106 occurred in the white section of the city and 72 in the negro. The infant mortality was 19; thirteen of these deaths were in the negro race and 6 in the white. For the following week, ending February 6, there was a slight diminution in the number of deaths, these being reduced to 175, divided 112 white and 63 negro. There were 12 deaths in infants under one year of age, 5 of whom were white children and 7 negro infants. So far, for the first 5 weeks of the year, there have been 39 fever deaths than in the corresponding period last year.

GRADUATE MEDICAL EDUCATION

The Dean of the Medical School of Columbia University, Dr. Willard C. Rappleye, announces a program of graduate medical education in this Medical School. The length of the course is apparently a minimum of three years and leads to the degree of Doctor of Medical Science. The fields of graduate study are:

Dermatology	Pathology
Internal Medicine	Pediatrics
Neurology	Psychiatry
Obstetrics and Gynecology	Radiology
Ophthalmology	Surgery
Orthopedic Surgery	Tropical Medicine
Otolaryngology	Urology

These courses will give an opportunity for advanced study to those men wishing to take the examination held by the various boards of medical specialties, and the program conforms to the standards adopted in 1934 by the Council on Medical Education and Hospitals of the American Medical Association and the Advisory Board for Medical Specialties.

CONFERENCE ON FEVER THERAPY

In conjunction with the International Conference on Fever Therapy to be held at the Waldorf-Astoria Hotel on March 31, 1937, there will be a scientific and commercial exhibit staged.

The clinics will be held at the College of Physicians and Surgeons, Columbia University, New York City.

A large attendance of fever therapists from all over the world is expected. A very interesting and instructive program has been arranged and all of those who plan to attend the conference are urged to register promptly with the general Secretary, Dr. William Bierman, 471 Park Avenue, New York City. The registration fee is $15.00.

ASSOCIATION OF MILITARY SURGEONS

The Association of Military Surgeons of the United States announces the appointment of Mr. Robert Lewin as Director of its convention exhibits.

Mr. Lewin has very successfully directed the commercial exhibits of the American Association of Railway Surgeons and the American Association of Orthopedic Surgeons for a number of years. This year he is also directing the commercial exhibit held in conjunction with the International Fever Therapy Conference at the Waldorf-Astoria, March 31, 1937.

The commercial exhibits of the Association of Military Surgeons have been creating more attention each year and the exhibitors have found this to be a highly profitable meeting.

Anyone desiring information in connection with the Military Surgeons 1937 convention to be held at Los Angeles, October 14-16, should address Mr. Robert Lewin, 505 N. Michigan Ave., Chicago, Ill.

The International Congress on Hepatic Insufficiency will be held at Vichy, September 16-18, 1937.

WOMAN'S AUXILIARY

Louisiana State Medical Society

President—Mrs. James Byron Vaughan, Monroe.

President-Elect—Mrs. George D. Feldner, New Orleans.

First Vice-President—Mrs. F. G. Ellis, Shreveport.

Second Vice-President—Mrs. T. H. Watkins, Lake Charles.

Third Vice-President—Mrs. E. B. Middleton, Homer.

Fourth Vice-President—Mrs. R. R. Arceneaux, Welsh.

Recording Secretary—Mrs. C. Grenes Cole, New Orleans.

Corresponding Secretary—Mrs. Joseph P. Brown, Monroe.

Treasurer—Mrs. Courtland P. Gray, Monroe.

Parliamentarian—Mrs. R. T. Lucas, Shreveport.

OUACHITA PARISH

Beautiful spring flowers banked the luncheon table at the Lotus Club where members of the auxiliary to the Ouachita Parish Medical Society gathered for their regular monthly social and program meeting, with Mrs. A. G. McHenry and Mrs. P. L. Perot hostesses.

Mrs. A. G. McHenry's talk on "Romance of Medical Men of the South," was an interesting feature of the luncheon hour. General conversation revolved around the state convention to be held in Monroe during the month of April.

Mrs. DeWitt Milam, Mrs. A. G. McHenry, Mrs. C. P. Gray and Mrs. R. W. O'Donnell gave an interesting report on the recent meeting of the auxiliary in Shreveport honoring the state president, Mrs. J. B. Vaughan, who, to the regret of every member, was unable to be present at this time.

Mrs. W. L. Bendel, Chairman,
Press and Publicity.

CADDO PARISH

The Woman's Auxiliary to the Shreveport Medical Society entertained at the Junior League Style Revue at the Washington-Youree in honor of Mrs. James Byron Vaughan of Monroe, president of the Woman's Auxiliary to the Louisiana State Medical Society, and Mrs. Frederick G. Ellis of Shreveport, first vice-president of the State auxiliary. The models included fourteen young matrons, wives of Shreveport physicians.

We feel that we are particularly fortunate in having in Mrs. C. E. Rew, a parliamentarian who is also an excellent teacher. Taking advantage of her willingness to share with us her knowledge of Parliamentary Law, the committee on Public Relations organized a class among the members of the Executive Board. There have been five meetings, with two yet to follow, and they have been instructive and delightful. All of those who have taken this course are enthusiastic about what it will mean to them, and the committee feels that it has made a distinct and unique contribution to the matter of Public Relations.

We are happy to report that $194.19 was received for Preventorium Work through the sale of Tuberculosis Seals. Fourteen speakers were heard before forty-three Parent-Teacher groups and students. This appeal was not only made for the success of the seal sale but contained valuable information to these groups on tuberculosis, assuring them it was a disease that was curable. A distance of approximately four hundred miles was traveled to cover all schools in Caddo and Bossier parishes and city schools.

Mrs. W. R. Mathews, Chairman.
Press and Publicity.

ORLEANS PARISH

On Wednesday, February 10, the Woman's Auxiliary to the Orleans Parish Medical Society enjoyed one of the delightful meetings of the year, when they entertained the mothers of both doctors and auxiliary members at a Valentine party. The club rooms were gay and attractive with spring flowers while each mother was presented with a corsage in honor of the occasion.

After an interesting musical program, the members, with their guests, enjoyed a social hour around the tea-table. It is always a privilege to entertain those so near and dear to us and so we still have something to look forward to on March 30 which is Doctor's Day, when we shall have the pleasure of doing honor to our own doctors.

Mrs. Edgar Burns, Chairman,
Press and Publicity.

FURTHER NEWS FROM OUACHITA PARISH

You are cordially invited:

Won't you wives of all the "Medics"
Visit us at our Convention,
The many things we'll do for you,
I don't have space to mention.

A boat ride on the Ouachita,
You can't afford to miss ,
Convention folks in days gone by
Describe it as pure bliss.

Golf, banquets, bridge, or what you will,
What'ere you like to do,
Your happiness will be our aim,
So come, now this means you.

A meeting of the Executive Committee of the Woman's Auxiliary to the Louisiana State Medical Society was held in Monroe February 16, 1937 at the Lotus Club. Routine business was transacted. Mrs. J. B. Vaughan, State President, was hostess for luncheon, but in her absence due to illness, the Vice-President, Mrs. F. G. Ellis of Shreveport, presided. The following members were present.

Mrs. F. G. Ellis, Shreveport—Vice-President.

Mrs. A. A. Herold, Shreveport—Chairman of Legislation.

Mrs. Frank Walke, Shreveport—Chairman of Public Relations.

Mrs. G. D. Feldner, New Orleans—President-Elect.

Mrs. C. G. Cole, New Orleans—Recording Secretary.

Mrs. H. Marlatt, Homer—Chairman of Indigent Physicians.

Mrs. E. B. Middleton, Homer—Third Vice-President.

Mrs. C. P. Gray, Monroe—State Treasurer.

Mrs. D. T. Milam, Monroe—Chairman of Exhibits.

Mrs. J. Q. Graves, Monroe—Hygeia Chairman.

Mrs. A. D. Tisdale, Monroe—Program Chairman.

Mrs. A. G. McHenry, Monroe—Councilor of Fifth District.

Mrs. A. L. Peters, Monroe—Printing Chairman.

Mrs. R. W. O'Donnell, Monroe—Chairman of Finance.

ATTENTION!! AUXILIARY PRESIDENTS AND CHAIRMEN OF COMMITTEES!!

Our State President, Mrs. J. B. Vaugham, has requested that all annual reports be sent in to her by April 6, 1937, as it is necessary for some of these reports to be sent to the A. M. A. Your cooperation will be greatly appreciated. Mrs. J. B. Vaughan's address is 2004 Riverside, Monroe, Louisiana.

In the April issue of this Medical Journal will be detailed information about the annual meeting to be held in Monroe April 26, 27, and 28, 1937.

An arrangement has been made with our local newspapers to publish an editorial honoring our doctors on "Doctor's Day." In addition to this, each doctor is to be remembered with a boutonniere and flowers are to be sent to each office on the morning of March 30. Open house for the doctors and their wives on the evening of the same day will be held.

Mrs. D. T. Milam,
Recording Secretary.

JEFFERSON DAVIS PARISH

The Woman's Auxiliary to the Jefferson Davis

Parish Medical Society met in Jennings for their February meeting at the home of Mrs. John M. Whitney.

Mrs. R. R. Arceneaux and Mrs. Claude A. Martin contributed numbers relating to medical science.

Plans for the celebration of "Doctor's Day" were discussed, after which a social hour was enjoyed.

Mrs. Claude A. Martin, Chairman,
Press and Publicity.

DEAR READERS:

Don't forget to read the Woman's Auxiliary news now published in the "Journal" of the American Medical Association each week. These columns contain much of great interest to all of us.

The dates of the "Your Health" broadcasts are listed in the Journal under "Official Notes" in the Organization Section. Make note of them and listen in.

Mrs. George D. Feldner, State Chairman,
Press and Publicity.

BOOK REVIEWS

To Raise These Halt: By Fred Rothermell. New York, Lee Furman, Inc. 1936. pp. 350. Price $2.50.

This novel centers around the medical practice of Dr. Norman Dour, trained in medical ethics to treat with sympathy and charity the ill in mind and body. The cheerless and unending ill luck which trail Dr. Dour's footsteps, even to final disaster, remind one of H. H. Richardson's Ultima Thule, published in 1929, the more so in that the drama of both stories makes the characters live. The present theme emphasizes the principles of medical ethics and tacitly would seem to attribute Dr. Dour's spiritual and financial failure to his following too closely in the narrow path thus marked, the while his confreres, laboring under no such inhibitions, enjoy a financially affluent practice. One wishes that the benefits of an ethical medical practice might have been as carefully portrayed as its hardships.

MARY LOUISE MARSHALL.

Trachoma: By A. F. MacCallan, C. B. E., M. D, F. R. C. S. London, Butterworth & Co., Ltd., 1936 pp. 225. Price L1.1.0. net.

When better books are written on trachoma, MacCallan's work will have inspired them. No one has had greater experience with "The Scourge of Human Sight", and probably no one has done more, directly or indirectly, to reduce it than the author. The style of this readable and interesting volume lends itself easily to visualization. It is written with a conviction contained in a few ophthalmic works. The author's discussion of the Clinical Manifestations and Stages of Trachoma which have become classic, illustrate that highly technical and difficult subjects can be presented understandingly in a simple manner. Chapters five and six on Differential Diagnosis and Treatment are gems of medical writing. The subsequent chapters on Pathological Anatomy, Epidemiology and the History of Trachoma are complete and thorough. The illustrations, which are almost entirely in color, are not numerous but very well done. The completeness and orderly sequence in the table of contents shows the extreme familiarity of the author with the subject.

Fortunately, for the good people of our state, but little trachoma exists in Louisiana. In other sections of the world, however, where trachoma is a major cause of blindness, ophthalmology and the public owe a specially deep debt of gratitude to the author for this outstanding work.

CHAS. A. BAHN, M. D.

Allergic Diseases: Their Diagnosis and Treatment: By R. M. Balyeat, M. A., M. D., F. A. C. P. 4th ed. rev. and enl. Philadelphia, F. A. Davis Co., 1936. pp. 516. Price $6.00.

The fourth edition of Balyeat's book is somewhat disappointing. Since he first published his book, a great deal of additional knowledge in the field of allergy has been acquired; yet Balyeat, other than amplifying a few of the chapters, has included very little of this information. This edition contains essentially the same information as the previous editions. Only a few of the botanic surveys that have been made in various parts of the United States are listed by the author. In his discussion of ragweed hay fever he states that unless patients are desensitized with pollens to which they showed skin reactions, other than ragweed, although, symptoms do not start until ragweed pollination, in addition to ragweed desensitization, good therapeutic results cannot be expected. On the other hand, on page 33, appears this interpretation of skin tests "of asthmatic children—95% were found sensitive to some food, but on careful study it was considered that food was a definite factor in only 50 percent". In one instance, he considers a positive skin reaction of etiologic significance despite the absence of clin-

ical sensitivity, and in the other, he finds positive skin reactions of no etiologic significance.

The chapters devoted to skin tests are very sketchy. Other than stating that intradermal testing is complicated, further utilitarian information is lacking. The description of the preparation of extracts is only vague. The statement "the solution used for extracting is made from glycerin, salt and other chemicals" without further details, is certainly not informative. The chapter devoted to desensitization contains only the most meager information. Other than stating that the principal underlying desensitization is that of building up a tolerance, further details of treatment are left out. Initial dosage, rate of increase in dosage, tolerance dose, maintenance dose, intervals between injections, the duration of treatment, are omitted in the chapter on specific treatment.

Balyeat devotes considerable space to the use of lipiodal in the treatment of asthma; particularly in the type asthma he calls intractable. However his definition of what constitutes intractable asthma is quite different from what is generally understood by the term. If I understand English, intractable means unmanageable, yet the author defines intractable asthma as "patients who between periodic attacks of severe asthma had only mild attacks daily or raised considerable purulent mucus or semi-purulent material". By this definition, the great majority of asthmatics would be classified as "intractable". And this is far from the case.

There are chapters on various other manifestations of allergy, to-wit., conjunctivitis, migraine, urticaria, dermatoses and so forth.

B. G. Efron, M. D.

The Truth About Bright's Disease: By William R. Ohler, M. D., Cambridge, Harvard University Press, 1936. pp. 80. Price, $1.00.

This small book represents one of a group of popular lectures given by the Harvard School of Medicine. The subject matter briefly covers the types of nephritis in a form both scientifically correct and linguistically lay.

I. L. Robbins, M. D.

Annual Reprints of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association. Chicago, 1936. pp. 139. Price $1.00.

This small brochure of 139 pages contains the reports of the Council that have been adopted and authorized for publication during 1935. In addition to the reports and editorials which are reprinted from the Journal, there are other reports, of less general interest, which appear here for the first time. To anyone who is not specifically interested in certain of the proprietary drugs discussed here, the chief value of the book is that it is a convenient collection of recent information on several drugs of current interest. Prominent among the preparations which are thus included are acetyl beta-methylcholine, aminoacetic acid, liver concentrates, cyclopropane, dinitrophenol and gonococcus bouillon filtrate.

R. P. Walton, Ph. D.

New and Nonofficial Remedies, 1936: Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1936. Chicago, 1936. Price $1.50.

Each annual edition of this publication further emphasizes the increasingly vital function of the Council. The critical evaluation of new proprietary drugs progressively becomes the responsibility of organizations rather than of individuals. The Council, with its staff of consultants, continues to perform a service to the profession which is unequalled by any similar organization. This edition differs from the preceding chiefly by revisions in the articles dealing with amidopyrine derivatives, local anesthetics, anti-luetic drugs, calcium compounds, carbon tetrachloride, cinchophen derivatives, liver preparations, serums, vaccines and hormone preparations.

R. P. Walton, Ph. D.

Diseases of the Coronary Arteries and Cardiac Pain: Edited by Robert L. Levy, M. D., Macmillan Co., New York, 1936, pp. 445. Price $6.00.

The very great increase in the number of deaths in the United States attributed to coronary obstruction reflects the more general recognition of the extreme importance and the increasing attention being paid to this disorder. There has been a tremendous amount of work and innumerable papers have been presented on this subject. It seems particularly appropriate that Levy, one of the foremost students of this heart disorder, should collect the information gleaned in the last twenty years, into a single volume. Especially is he to be complimented on the fact that for the authors of the various sections of this symposium on coronary diseases he has selected as co-writers the outstanding contributors in this country to the knowledge of coronary arterial disease. Also is it his good fortune to have these men accept their assignments. The introduction was written by Alfred Cohn who gives a succinct discussion of what is to follow. He notes that most of the authors have abandoned the old term of angina pectoris and have used in its place the expression, coronary pain. The reviewer, as is Dr. Cohn, is apparently somewhat in doubt about the advisability of making such a change in medical terminology.

No man could more fittingly have been selected

to present the opening historical note than Dr. James B. Herrick who is truly responsible for introducing to the medical world coronary occlusion as a clinical entity. In the next chapter, Dr. Joseph T. Wearn, whose studies on coronary circulation and anatomy of the heart are well known, gives a most clear and illuminating description of the arteries and veins of the heart.

To Dr. C. J. Wiggers is assigned the section on the physiology of the coronary circulation, a most comprehensive and scientific exposition. The pharmacology of the coronary circulation is presented by Dr. Fred Smith and the pathology of the coronary arteries by Dr. W. C. VonGlahn. These sections are concise but complete. The following section is by Dr. James C. White on pathways of pain and then comes another chapter by Dr. Wiggers, thought provocative and interesting, on the physiology of cardiac pain. Statistics are dwelt upon by Dr. Louis Dublin.

Levy has presented in a masterful way the next two chapters dealing with arteriosclerosis of the coronary arteries, and syphilis of these vessels, as well as two subsequent chapters on the treatment of these two conditions. These chapters are entirely adequate, extremely practical and will probably be more read by practitioners of medicine than any of the other chapters because after all it is in the facts brought out in these chapters that the average medical man is primarily interested.

W. J. Kerr has a difficult apportionment but, in his chapter on the less common affections of the coronary arteries, he gives a splendid account of embolism, periarteritis nodosa, rheumatic arteritis and aneurysm of the coronary vessels. Paul White's section on the clinical significance of cardiac pain is a splendid chapter. Here cardiac pain is used in part as a synonym for angina pectoris.

Any reviewer would expect a dissertation by Frank Wilson on electrocardiographic changes that take place in disease of the coronary arteries to be outstanding. It is.

The last part of the book has to do with surgical treatment of disease of the coronary arteries and cardiac pain (angina pectoris). These chapters are by James C. White, H. L. Blumgart, and Claude S. Beck. Of the methods recommended by these several authors in the treatment of these conditions the alcoholic injections have received a certain measure of success but certainly there is not the enthusiasm for this mode of treatment that there was a few years ago. As for total thyroidectomy, again the operative procedure is not quite as cheerfully agreed upon as a valuable measure as it was several years ago. Certainly, as Blumgart says, the cases must be properly and carefully selected and it is still a debatable question whether or not they should be operated upon earlier than they are now, if the measure is to be well worth while. Beck's operative procedure, to supply additional blood to the heart by operation, is still within the realm of experimental medicine and surgery.

This book represents one of the really valuable contributions to medical literature that has appeared for some years. The subject matter is clearly expressed by those well qualified to write on their assigned subject. The format is excellent, the illustrations are clear and well selected.

J. H. Musser, M. D.

You Must Eat Meat: By Max Ernest Jutte, M. D., New York, G. P. Putnam's Sons, 1936. pp. 164. Price $2.00.

This small book is an interestingly written and well presented discussion about a subject which is of vital importance both to physician and layman. The first portion of the book is devoted to the physiology of the gastrointestinal tract and the body chemistry in general, in terms readily understood by everyone. Following this is a consideration of diets—fads, fancies, and facts—and, as a climax, the explanation and application of the Salisbury Meat Diet in various conditions.

It is a book well worth reading, primarily because of the different perspective of the much mooted question, the place of meat in the diet, and also for the world of informaton about the body and its mechanics and its chemistry.

Peter Everett, M. D.

Practice of Medicine: By Jonathan Campbell Meakins, M. D., LL. D. St. Louis, C. V. Mosby Co., 1936. pp. 1343. Price $10.00.

Every now and then out of the welter of innumerable inconsequential books there appears one that arrests our attention and compels our earnest consideration. In a trice the inescapable fact is borne upon us that here is a book that is a literary achievement, a real contribution to medicine. Such a volume is the large tome devoted to the practice of medicine by Jonathan C. Meakins. It contains over 1400 pages and its 500 illustrations, numbering many splendid roentgen ray photographs and colored blood pictures, constitute a novel and vital part of its composition. The eminent author, impressed with the power of pictorial portrayal in the teaching of medicine, has pioneered a path in the making of text books of medicine that should be fruitful of great good in pointing out a potent method for those interested in advancing and disseminating medical information.

As one reads this large volume one soon notes to what a notable degree of success the author has coupled encyclopedic knowledge and wisdom with a practicability that should be of real value to the practitioner for whom the work is primarily

intended. Yet, paradoxical as it may sound, in its largeness lies its principal weakness. The author has attempted to incorporate so much material into one book that he has been obliged, of necessity, to make many comparatively important subjects entirely too brief. All of the systems of medicine that are the province of the practitioner in general medical practice are treated with the exception of the skin and its diseases. In the chapters devoted to Diseases of Circulation and Respiration and especially those portions which deal with physiology, normal and abnormal, of the heart, the lungs and the circulation, the author achieves his tour de force. And this in itself is more than sufficient compensation for the weakness noted above. Several of the chapters have been assigned to various contributors, specialists in their subjects and all of them have performed a splendid task in keeping with the high quality of the book, set by Meakins.

The introduction to the Practice of Medicine is a medical masterpiece. It deals with the art of history writing, the approach to the patient and a most invaluable analysis of the symptoms presented by a thousand patients in whom he found that the six most frequent symptoms encountered in their order of frequency were: pain, weakness loss of weight, fatigue, dyspnea and fever.

Another accomplishment worthy of note, particularly in a text book, is the very recent information to be found within its covers. One feels that the author has been so far ahead in the van of modern medical achievements that, through his own accomplishments and that of the small but brilliant coterie of medical investigators and physicians, he has been able to incorporate into his book information that is not even now the property of many good current medical journals.

At the end of each subject is a splendid reference list and the general index is most usable.

The critic is aware that only too often the evaluation of a book in such a general way can be of little value to the reader to help him in an effort to arrive at a conclusion as to the real merit of the book. To this the answer of the critic must be that so large a book of so much diversified material cannot be elaborated upon. The detailed consideration of every subject would entail space far beyond the ordinary confines of the space allotted to book reviews in the journal. It becomes necessary, therefore, to draw general conclusions which are in his opinion honest and sincere. That remarks may occasionally appear entirely too laudatory is a human failing, the common heritage of all who read even though we are cognizant of the necessity of the critic being detached and objective in his approach.

It behooves the critic to say, in all frankness, that the book is not perfect in all respects. There is not a well proportioned balance of the material. Changes in subsequent editions must be made. More detailed methods of treatment might be most welcome. As for the book itself one might find fault with a bulkiness that does not lend itself readily to the comfort of the chair. It is definitely difficult to handle but it is certainly worth the trouble and more than repays the one who reads it.

I. L. Robbins, M. D.

Diseases of Infancy and Childhood: By Wilfred Sheldon, M. D. (Lond.), F. R. C. P. (Lond.), with a foreword by G. F. Still, M. A., M. D., LL. D., F. R. C. P. Philadelphia, P. Blakiston's Son & Co. 1936. pp. 738. Price, $7.00.

In a well illustrated and beautifully edited volume of some 700 pages, the author has condensed a wealth of pediatric knowledge and clinical experience. Yet, condensation has not been attained at the expense of completeness, as nothing essential is omitted, nor through the sacrifice of style, for the book is delightful to read.

This book should be equally useful as a text for medical students and as a reference for the practicing pediatrist.

Ina M. Harper, M. D.

International Clinics, vol. 4, 1936. Phila., J. B. Lippincott Co., 1936. pp. 352.

In this new volume are again found many timely articles. To mention only a few, and by no means the only ones of superior merit, are those dealing with gastroscopy, nutritional edema, cardiac arrhythmias, and collapse therapy in tuberculosis. As so often remarked in the past, it again justifies the time any physician may employ in its perusal.

I. L. Robbins, M. D.

Text-book of Pathology: By Francis Delafield, M. D. and T. Mitchell Prudden, M. D.; Revised by Francis Carter Wood, M. D. New York, William Wood & Co., 1936, 16th ed. pp. 1406. Price $10.00.

The revision of a work which has enjoyed the status of a standard text in pathology since its first edition in 1885 necessarily requires considerable thought and experience on the part of the reviewer and his assistants. This edition reflects such in its clear, concise and accurate presentation.

The general outline of the past editions, consisting of: first, General Pathology; second, Special Pathology; and third, Post-Mortem Examinations, has been retained.

Part I, containing the fundamentals of pathology, has been revised to include an excellent presentation of the effects of such physical agents as ex-

cessive and deficient heat; roentgen rays; and radium. Other added features include footnotes containing technics for the demonstration of various products of cellular degeneration and references for additional reading on the subjects presented.

Part II, entitled Special Pathology, contains a discussion of the pathology of the various organs, arranged according to systems. The most marked revision of this part of the work is in the chapter on the Nervous System. Valuable advances in staining technic, neuro-physiology, and, also, neuro-surgery, are included here. Some advantageous changes are also noted in the chapters on muscles, bones and joints, and the reproductive organs of the female.

Part III, which deals with the technic of the postmortem examination, includes valuable additions in the technic of preservation of various organs.

The book is fairly well illustrated by excellent drawings and by photographs, some of which are very good.

The clear, concise and accurate way in which this book is written makes it easily read by both student and practitioner. It may also be used to an advantage as a reference by the specialist in this field.

EDWIN H. LAWSON, M. D.

The Adrenals: By Arthur Grollman, PhD., M. D. Baltimore, The Williams and Wilkins Company, 1936, pp. 410. Price $5.00.

This complete volume contains a resume of the literature on the adrenals to date, together with the author's personal research and conclusions. Not one phase of the vast subject is left untouched.

The anatomy, gross, microscopic, and comparative, is discussed in detail in Part I. In Part II the medulla and its secretion, epinephrine, are widely reviewed, the chemistry, pharmacology, physiology, and therapeutic uses of epinephrine being presented in an orderly, concise, detailed manner.

The cortex is the subject matter of Part III, and the author delves into the effects of adrenalectomy, the preparation of the cortical hormone, its assay, and the relation of the adrenals to other organs.

Part IV is devoted to a study of Addison's disease, tumors of the adrenals, the adrenogenital syndrome, and other pathologic abnormalities of the adrenal.

In this work, the author attaches the name "androgenic" to the embryonic tissue found in the adrenal, as hypertrophy of this tissue gives rise to masculinization of the female, and such nomenclature seems justified.

The volume, though of some value to the practitioner, should be of greater interest and aid to the pharmacologist and physiologist, and especially to the research worker in these fields.

CONRAD G. COLLINS, M. D.

Brucella Infections in Animals and Man: By I. Forest Huddleson. New York, The Commonwealth Fund, 1934. pp. 108. Price $2.25.

It is only natural that the evolution of undulant fever (*Brucellosis hominis*) as a disease should be accompanied by an increasing amount of literature indicating the widespread interest in the disease and the therapeutic emergency that has arisen since our approach to diagnosis has become more scientific and the disease more commonly found. This monograph condenses the information on the genus *Brucella*, methods of isolating and culturing the organism, serologic, allergic and immunologic methods of diagnosis and the pathology produced by these organisms in the more commonly infected animals. Such a monograph is important because it makes available the diagnostic information accumulated to date on undulant fever to the clinician whose time for study is limited by the every day necessity of applying what he already knows to the patients at hand.

W. H. GILLENTINE, M. D.

Applied Dietetics for Adults and Children in Health and Disease: By Sanford Blum, A. B., M. S., M. D. Philadelphia, F. A. Davis Company, 1936. pp. 408. Price $4.75.

Blum's book consists essentially of lists of foods which are advised for consumption and foods which are to be avoided in various conditions encountered in the practice of medicine. The author has presented lists which are captioned so that the physician has merely to look up the index of the book, find the condition he is concerned with and then turn to an already prepared list of foods for his particular patient. The presentation is divided into two parts, the first including "Dietary for Adults in Health and Disease" and the second "Dietary for Infants and Children in Health and Disease". There is a general index and a food index. The diets are based on those the author employed "during a period of twenty years." There are no references made to the literature.

Each diet list is very generalized. The foods are rarely expressed quantitatively, and then only in general terms. Brief suggestions and discussions are made in regard to the diets and habits of eating. While the diets are generalized in many respects, they are quite specifically listed for rather specific types of patients and conditions. For instance, the author has a diet for "chronic indigestion in middle aged adults", "spare adult male—impaired digestion", "spinster with impaired digestion", "for frail young mother", "professional man", "frail woman school teacher" and

many other diet lists specifically captioned. Blum uses a different diet for treating obesity in a "woman thirty-five years old" and a "two-hundred-and-sixty-pound female clerk". No logical reasons are presented to warrant such minute differentiation. In the diet for a normal adult, Blum advises one to avoid such foods as duck, stew, tongue, goose, kidney, lobster, crab, beets, sprouts, sauces, gravies and many other foods which make up the average normal individual's diet. If such commonly consumed foods are to be avoided the author should at least present reasons. Again, Blum advises a "professional man" suffering from malnutrition to drink a "glass of water with a teaspoonful of salts on arising". Why such a practice? The term "salts" is quite indefinite in itself.

The book contains a list of foods which leaves the reader wondering why any one of them is selected or eliminated. The diets as listed cannot be intelligently prescribed nor can they aid the physician in understanding his diet problems. Such a list of names of foods fosters the use of diets for placebo rather than therapeutic purposes. The book can be of little use to the medical profession.

G. E. Burch, M. D.

Modern Treatment and Formulary: By Edward A. Mullen, P. D., M. D., F. A. C. S. Philadelphia, F. A. Davis and Company, 1936. pp. 707. Price $5.00.

This is a book small enough to go into a pocket, costing $5.00, containing nearly two thousand prescriptions, also brief and, in general, excellent short discussions of the treatment of common disorders and diseases arranged alphabetically. The above description sounds good, but, in the reviewer's opinion, the value of the book is largely destroyed by the lack of discrimination shown by the author in his choice of prescriptions. While many of these are excellent and of the type ordinarily prescribed, a too large number are worthless and some perhaps harmful.

The reviewer also disagrees most decidedly with certain statements, such as "in acute malaria quinine is the remedy of choice. In fact it is the best and only remedy". Granted that the value of atabrin is not yet finally established, a book published in 1936 should certainly refer to it. Should one holding a position as Assistant Professor of Pharmacology, as does the author, give his approval to prescribing for a patient with pneumonia six minims of tincture of digitalis with two and one half minims of tincture of belladonna four times a day? Or tincture of veratri viridis?

J. T. Halsey, M. D.

Diseases of the Nails: By V. Pardo-Castello. M. D. Springfield, Illinois, Charles C. Thomas, 1936. pp. 177. Price $3.50.

This concise treatise of the Diseases of the Nails is a request volume of 169 pages. Its existence follows a paper read before the Southern Medical Association at Richmond, Virginia.

Dr. Pardo-Castello received his medical training in American universities. He understands the difficulties of the treatment of the nails and has written an excellent text and with complete bibliography. The reproduction of photographs is well worth the price of the book.

M. T. Van Studdiford, M. D.

PUBLICATIONS RECEIVED

Emerson Books, Inc., New York: Genealogy of Sex by Curt Thesing, M. D.

Lea & Febiger, Philadelphia: A Hand-Book of Ocular Therapeutics, Second Edition, by Sanford R. Gifford, M. A., M. D., F. A. C. S.

The Macmillan Company, New York: Inhalation Anesthesia by Arthur E. Guedel, M. D. The Colon as a Health Regulator—From a Surgeon's Point of View by Sir Henry M. W. Gray, K. B. E., C. B., C. M. G., LL.D. (Aberdeen), M. B., C. M. (Aberdeen), F. R. C. S. (Edinburgh). Essentials of Electrocardiography by Richard Ashman, Ph. D., and Edgar Hull, M. D.

Oxford University Press, New York: Maternity and Post-Operative Exercises by Margaret Morris, C. S. M. M. G., in collaboration with M. Randell, S. R. N., S. C. M., T. M. M. G. Diseases of the Newborn by Abraham Tow, M. D.

The Science Press Printing Company, Lancaster: Abnormal Personality and Time by Nathan Israeli, Ph. D.

Frederick A. Stokes Company, New York: A Woman Surgeon, The Life and Work of Rosalie Slaughter Morton.

Charles C. Thomas, Baltimore: The Lung by William Snow Miller, M. D., Sc. D. The Fundamentals of Electrocardiographic Interpretation by J. Bailey Carter, M. D.

The University of Chicago Press, Chicago: Sickness and Insurance by Harry Alvin Millis.

The University of North Carolina Press, Chapel Hill: Medical Morals and Manners by Hubert Ashley Royster, M. D.

William Wood and Company, Baltimore: Surgical Diseases and Injuries of the Genito-Urinary Organs by Sir John Thomson-Walker, D. L., M. B., C. M. Ed., F. R. C. S. Eng., Second Edition, Revised, Edited by Kenneth Walker, M. A., M. B., B. C. (Cantab.), F. R. C. S. Eng.